SR 90/SR 80 CORRIDOR PROFILE STUDY

SR 90: I-10 TO SR 80
SR 80: SR 90 TO US 191

ADOT WORK TASK NO. MPD 0041-17
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DRAFT REPORT: PERFORMANCE AND NEEDS EVALUATION

AUGUST 2017

PREPARED FOR:

ARIZONA DEPARTMENT OF TRANSPORTATION

PREPARED BY:

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ACRONYMS & ABBREVIATIONS

AADT	Average Annual Daily Traffic
ABISS	Arizona Bridge Information and Storage System
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
ASLD	Arizona State Land Department
AZTDM	Arizona Statewide Travel Demand Model
BLM	Bureau of Land Management
BQAZ	Building a Quality Arizona
CCTV	Closed Circuit Television
CR	Cracking Rating
DCR	Design Concept Report
DMS	Dynamic Message Sign
FHWA	Federal Highway Administration
FY	Fiscal Year
HCRS	Highway Condition Reporting System
HERE	Real time traffic conditions database produced by American Digital Cartography Inc.
HPMS	Highway Performance Monitoring System
I-	Interstate
IRI	International Roughness Index
ITS	Intelligent Transportation System
LCCA	Life-Cycle Cost Analysis
LOS	Level of Service
LRTP	Long-Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century
MP	Milepost
MPD	Multimodal Planning Division
NB	Northbound
NPV	Net Present Value
OP	Overpass
P2P	Planning-to-Programming
PA	Project Assessment
PARA	Planning Assistance for Rural Areas
PDI	Pavement Distress Index
PES	Performance Effectiveness Score
PSR	Pavement Serviceability Rating
PTI	Planning Time Index
RTP	Regional Transportation Plan
RWIS	Road Weather Information System
SATS	Small Area Transportation Study
SB	Southbound
SEAGO	Southeastern Arizona Governments Organization
SERI	Species of Economic and Recreational Importance
SHSP	Strategic Highway Safety Plan
SOV	Single Occupancy Vehicle
SR	State Route
SVMPO	Sierra Vista Metropolitan Planning Organization
TAC	Technical Advisory Committee
TI	Traffic Interchange
TIP	Transportation Improvement Plan
TPTI	Truck Planning Time Index
TTI	Travel Time Index
TTTI	Truck Travel Time Index
UP	Underpass
USDOT	United States Department of Transportation
V/C	Volume-to-Capacity Ratio
VMT	Vehicle-Miles Travelled
WIM	Weigh-in-Motion

1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT) is the lead agency for this Corridor Profile Study (CPS) of State Route 90 (SR 90)/State Route 80 (SR 80) between the junction Interstate 10 (I-10) and junction US 191. The study examines key performance measures relative to the SR 90/SR 80 corridor, and the results of this performance evaluation are used to identify potential strategic improvements. The intent of the corridor profile program, and of ADOT's Planning-to-Programming (P2P) process, is to conduct performance-based planning to identify areas of need and make the most efficient use of available funding to provide an efficient transportation network.

ADOT has already conducted eleven CPS within three separate groupings or rounds.

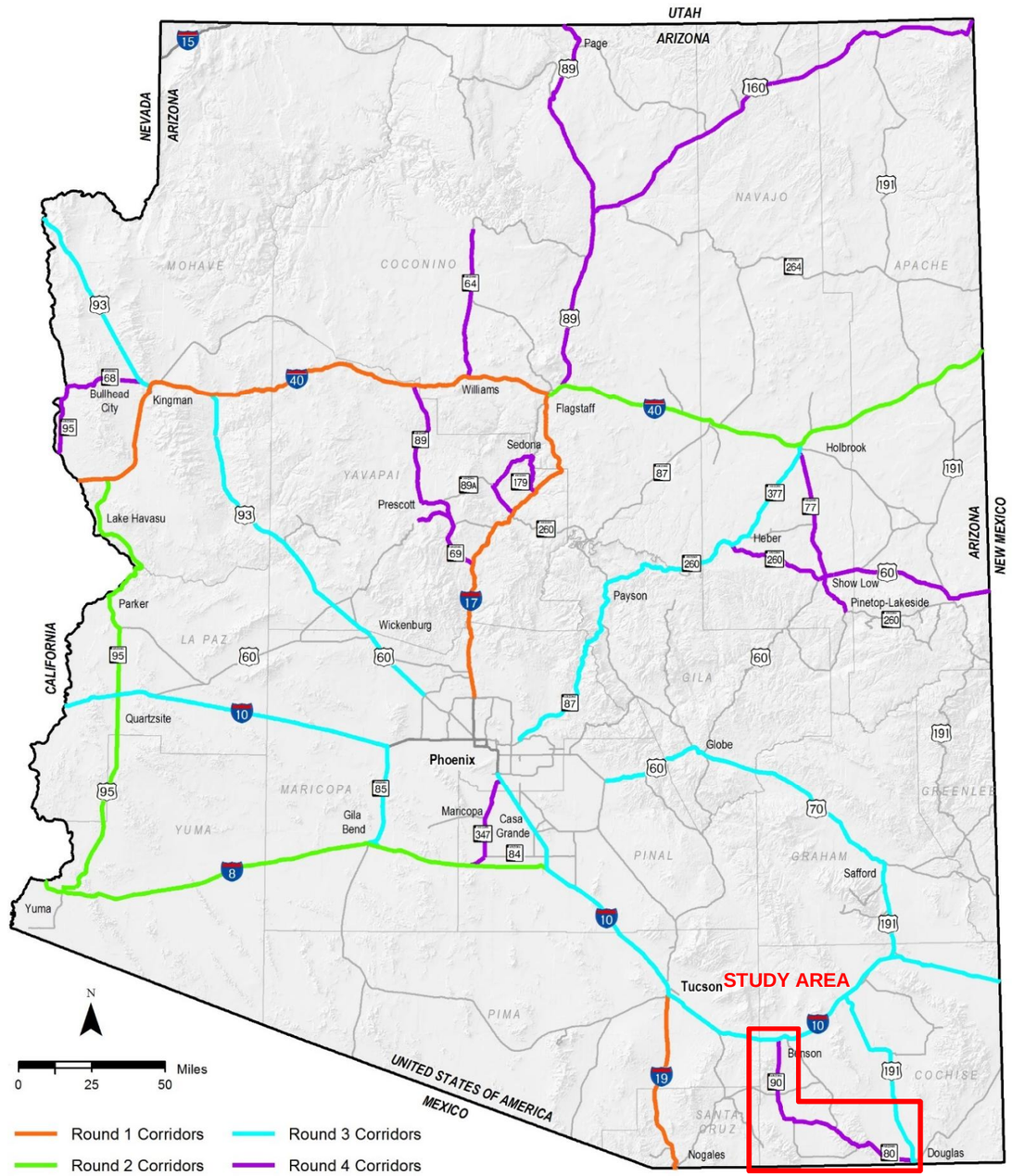
The fourth round (Round 4) of studies began in Spring 2017, and includes:

- SR 69/SR 89: I-17 to I-40
- US 89: I-40 to Utah State Line
- SR 64: I-40 to Grand Canyon National Park
- SR 179/SR 89A/SR 260: I-17 (Camp Verde) to I-17 (Montezuma Well Road)
- SR 347/SR 84: I-10 to I-8
- SR 260: SR 277 to SR 73; US 60: SR 260 to New Mexico State Line
- SR 77: US 60 to SR 377
- SR 68/SR 95: US 93 to California State Line
- US 160: US 89 to New Mexico State Line
- SR 90/SR 80: I-10 to US 191

The studies under this program assess the overall health, or performance, of the state's strategic highways. The CPS will identify candidate solutions for consideration in the Multimodal Planning Division's (MPD) P2P project prioritization process, providing information to guide corridor-specific project selection and programming decisions.

The SR 90/SR 80 corridor, depicted in **Figure 1** along with the previous three rounds corridors**,** is one of the strategic statewide corridors identified and the subject of this Round 4 CPS.

Figure 1: Corridor Study Area



1.1 Corridor Study Purpose

The purpose of the CPS is to measure corridor performance to inform the development of strategic solutions that are cost-effective and account for potential risks. This purpose can be accomplished by following the process described below:

- Inventory past improvement recommendations
- Define corridor goals and objectives
- Assess existing performance based on quantifiable performance measures
- Propose various solutions to improve corridor performance
- Identify specific solutions that can provide quantifiable benefits relative to the performance measures
- Prioritize solutions for future implementation, accounting for performance effectiveness and risk analysis findings

1.2 Study Goals and Objectives

The objective of this study is to identify a recommended set of prioritized potential solutions for consideration in future construction programs, derived from a transparent, defensible, logical, and replicable process. The SR 90/SR 80 CPS defines solutions and improvements for the corridor that are evaluated and ranked to determine which investments offer the greatest benefit to the corridor in terms of enhancing performance. Corridor benefits can be categorized by the following three investment types:

- Preservation: Activities that protect transportation infrastructure by sustaining asset condition or extending asset service life
- Modernization: Highway improvements that upgrade efficiency, functionality, and safety without adding capacity
- Expansion: Improvements that add transportation capacity through the addition of new facilities and/or services

This study identifies potential actions to improve the performance of the SR 90/SR 80 corridor. Proposed actions are compared based on their likelihood of achieving desired performance levels, life-cycle costs, cost-effectiveness, and risk analysis to produce a prioritized list of solutions that help achieve corridor goals.

The following goals are identified as the desired outcome of this study:

- Link project decision-making and investments on key corridors to strategic goals
- Develop solutions that address identified corridor needs based on measured performance
- Prioritize improvements that cost-effectively preserve, modernize, and expand transportation infrastructure

1.3 Corridor Overview and Location

The SR 90/SR 80 corridor between I-10 and US 191 provides movement for freight, tourism, and recreation needs within southeastern Arizona. It provides a key link between I-10 and the United States (US)/Mexico border crossing at Douglas/Agua Prieta and connects Benson, Sierra Vista, Bisbee, and Douglas. This corridor also serves the Kartchner Caverns State Park and other recreational and historic areas. The SR 90/SR 80 corridor between I-10 and US 191 is approximately 78 miles in length.

1.4 Corridor Segments

The SR 90/SR 80 corridor is divided into 10 planning segments to allow for an appropriate level of detailed needs analysis, performance evaluation, and comparison between different segments of the corridor. The corridor is segmented at logical breaks where the context changes due to differences in characteristics such as terrain, daily traffic volumes, or roadway typical sections. Corridor segments are described in **Table 1** and shown in **Figure 2**.

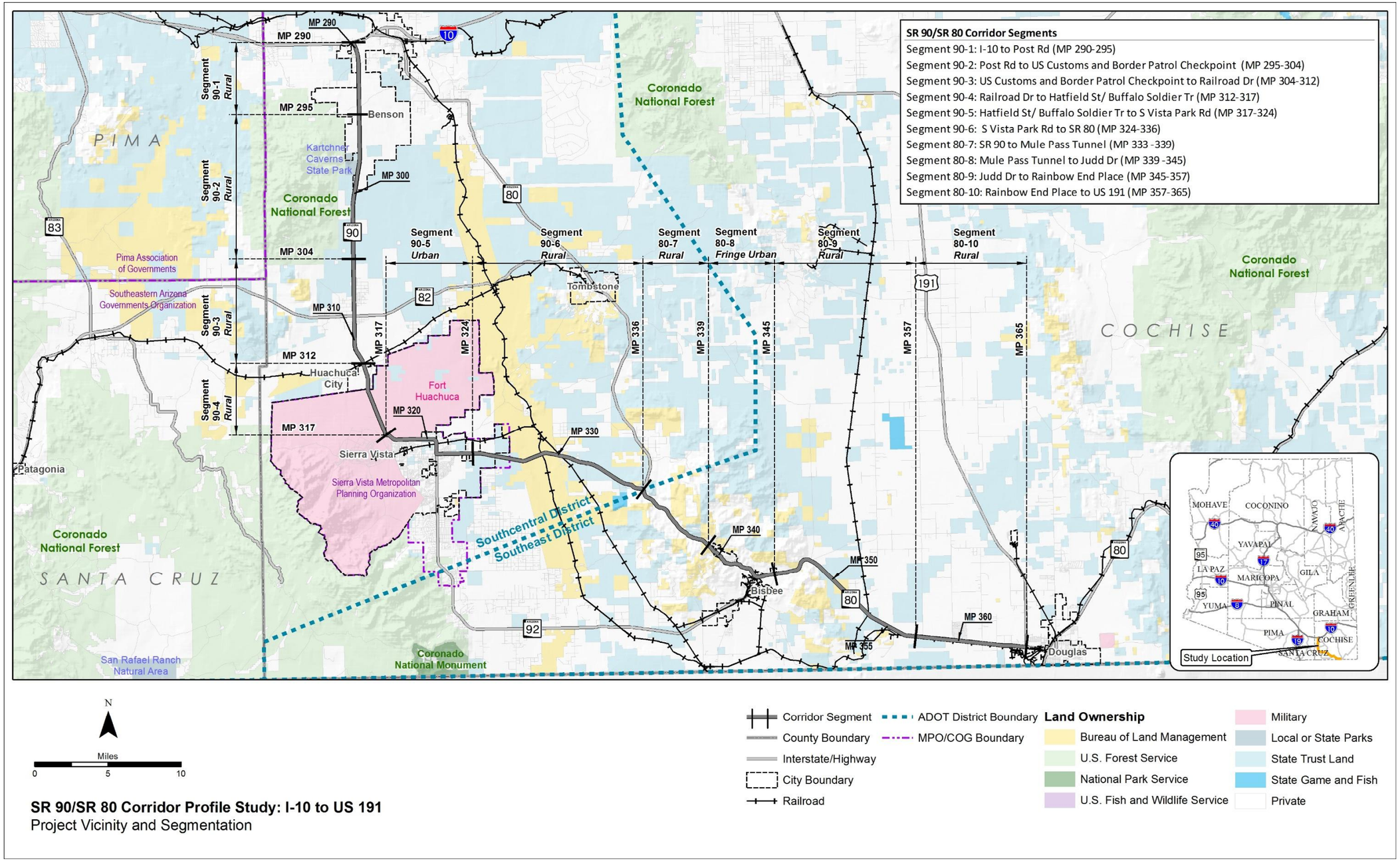
Table 1: SR 90/SR 80 Corridor Segments

Segment #	Route	Begin	End	Approx. Begin Milepost	Approx. End Milepost	Approx. Length (miles)	Typical Through Lanes (NB/EB, SB/WB)	2015/2035 Average Annual Daily Traffic Volume (vpd)	Character Description
90-1	SR 90	I-10	Post Rd	290	295	5	2,2	10,000/15,000	This rural segment has interrupted flow, consistent traffic volumes, a four-lane divided section, and is located within the incorporated area of Benson. There is a traffic signal located at the SR 90/Whetstone Commerce Dr/Village Loop intersection, near the I-10 interchange.
90-2	SR 90	Post Rd	US Customs and Border Patrol Checkpoint	295	304	9	2,2	10,000/15,000	This rural segment has interrupted flow, consistent traffic volumes, and a four-lane divided section. The entrance to Kartchner Caverns is located at MP 298.5. A United States Customs and Border Patrol checkpoint is located at approximately MP 304.5.
90-3	SR 90	US Customs and Border Patrol Checkpoint	Railroad Dr	304	312	8	2,2	12,000/16,000	This rural segment has interrupted flow and consists of a four-lane divided section. There is a traffic signal at the SR 90/SR 82 intersection at MP 308.4. There is a frontage road on the west side of the road between MP 308.1 - 308.3.
90-4	SR 90	Railroad Dr	Hatfield St/ Buffalo Soldier Trail	312	317	5	2,2	16,000/22,000	This rural segment has uninterrupted flow, a five-lane undivided section, and traverses the town of Huachuca City. Gonzales Blvd runs parallel to and east of SR 90 and serves as a frontage road for part of this section. The road transitions to a four-lane undivided section at approximately MP 314.1.
90-5	SR 90	Hatfield St/ Buffalo Soldier Trail	S Vista Park Rd	317	324	7	2,2	15,000/17,000	This urban segment with interrupted flow is in the City of Sierra Vista and has a four-lane undivided section between the Hatfield St/Buffalo Soldier Trail and Industry Drive. South of Industry Drive, the road becomes a four-lane divided section. East of the Fry Blvd/SR 92 intersection the road transitions to a five-lane section. There are seven traffic signals located in this segment, at the Hatfield Drive/Buffalo Soldier Trail, 7th St, Coronado Drive, Campus Drive, Martin Luther King Jr. Parkway/Charleston Rd, Fry Blvd, and Avenida De Sol/Giulio Cesare Ave intersections.
90-6	SR 90	S Vista Park Rd	SR 80	324	336	12	1,1	5,000/6,000	This rural segment has primarily uninterrupted flow, and is comprised of a two-lane undivided section. The road briefly widens to accommodate four-through lanes at the Moson Road signalized intersection.
80-7	SR 80	SR 90	Mule Pass Tunnel	333	339	6	1,1	5,000/3,000	This rural segment with uninterrupted flow is comprised of a two-lane undivided section. There is a passing lane section from approximately MP 337.6 to MP 338.5.

Table 2: SR 90/SR 80 Corridor Segments (continued)

Segment #	Route	Begin	End	Approx. Begin Milepost	Approx. End Milepost	Approx. Length (miles)	Typical Through Lanes (NB/EB, SB/WB)	2015/2035 Average Annual Daily Traffic Volume (vpd)	Character Description
80-8	SR 80	Mule Pass Tunnel	Judd Dr	339	345	6	1,2 2,2 1,1	5,000/3,000	This fringe urban segment with interrupted flow traverses the City of Bisbee and the community of Warren. There is a three-lane undivided section with two through lanes westbound from approximately MP 339.0 to MP 339.6 and MP 340.4 to 341.4. Traffic uses ramps to access the Old Bisbee area. East of Old Bisbee, this segment has a four-lane undivided section, which narrows to a two-lane undivided section near the Bisbee roundabout. There are several curves in this section, which traverses the Bisbee copper mine area.
80-9	SR 80	Judd Dr	Rainbow End Place	345	357	12	1,1	5,000/2,000	This rural segment with uninterrupted flow is a two-lane undivided section.
80-10	SR 80	Rainbow End Place	US 191	357	365	8	2,2	5,000/3,000	This rural segment with interrupted flow has a four-lane divided section. There is a traffic signal at the US 191 intersection.

Figure 2: Corridor Location and Segments



SR 90/SR 80 Corridor Profile Study: I-10 to US 191
Project Vicinity and Segmentation

1.5 Corridor Characteristics

The SR 90/SR 80 corridor is an important travel corridor in the southeastern part of the state. The corridor functions as a route for recreational, tourist, freight, and cross border and regional traffic and provides critical connections between the communities it serves and the rest of the regional network.

National Context

The SR 90/SR 80 corridor is a strategic transportation link across southeast Arizona for freight, intercity, international and tourism travel. The SR 90/SR 80 corridor links I-10 to the Douglas Port of Entry. This corridor also serves Fort Huachuca, a major U.S Army installation and military intelligence center.

Regional Connectivity

The SR 90/SR 80 corridor between I-10 and US 191 provides movement for freight, tourism, and recreation needs within southeastern Arizona. The corridor is located in two ADOT Districts (Southcentral, and Southeast); two planning areas (Sierra Vista Metropolitan Planning Organization (SVMPO) and SouthEastern Arizona Governments Association (SEAGO) and in Cochise County. Within the corridor study limits, SR 90/SR 80 offers connections to several major roadways, including I-10, US 191, SR 82, and SR 92. This corridor serves Arizona cities and towns including Benson, Bisbee, Douglas, Sierra Vista, and Huachuca City. Douglas has a border crossing with Mexico, providing access to Agua Prieta, Sonora, a town of approximately 79,000 persons.

Commercial Truck Traffic

Communities along the SR 90/SR 80 corridor are dependent on the corridor to access the state economy through freight deliveries and travel to other locations. The corridor also services local mining operations. Freight traffic (trucks) comprise from 7% to 20% of the total traffic flow on the corridor, with the higher truck percentages on SR 90 near I-10 and SR 80, between Paul Spur Road and US 191.

Commuter Traffic

A majority of the commuter traffic along the SR 90/SR 80 corridor occurs within the urbanized areas of Benson, Bisbee, Sierra Vista, and Douglas. These areas are economic centers along what is considered mostly a rural combination of state routes. According to the most recent traffic volume data maintained by ADOT, traffic volumes range from approximately 5,000 vehicles per day on sections of SR 80 to approximately 15,000 vehicles per day on SR 90 in Sierra Vista.

According to the 2015 American Community Survey data from the US Census Bureau, 89% of the workforce in Cochise County relies on a private vehicle to get to work.

Recreation and Tourism

SR 90/SR 80 provides access to Arizona attractions such as state parks, museums, historic sites, and other recreational activities.

SR 90 provides access to the Kartchner Caverns State Park. In the Sierra Vista area, nearby recreation opportunities include the Ramsey Canyon Preserve, the San Pedro National Conservation area, the Coronado National Monument in the Huachuca Mountains. SR 80 provides access to Bisbee, where visitors can take underground tours of the Queen Copper Mine, or visit historic Warren Ballpark, the oldest ballpark in the US still in use, and explore the Old Bisbee area, with its many historic buildings. SR 80 provides access to Douglas, which is home to the historic Gadsden Hotel as well as many historic buildings.

Multimodal Uses

Freight Rail

The San Pedro and Southwestern Railroad (SPSR) runs from a connection with the Union Pacific Railroad at Benson to Curtiss, Arizona. A track is available for transloading at Benson. SPSR's sole customer, at Curtiss, produces ammonium nitrate and generates approximately 1,350 annual carloads (inbound anhydrous ammonia, outbound fertilizer). SPSR serves this customer three days a week.[1]

Passenger Rail

The Union Pacific Railroad Sunset Limited route provides intercity passenger service three times a week to the community of Benson, as well as Tucson, Maricopa, and Yuma.

Bicycles/Pedestrians

There are opportunities for bicycle and pedestrian travel on the SR 90/SR 80 corridor. Segments of the SR 90/SR 80 corridor are on U.S. Bicycle Route 90, part of a network of interstate long-distance cycling routes. These segments include SR 90, between SR 82 (MP 308) and the SR 90 Bypass/Hatfield Rd (MP 317), SR 90, between SR 92 (MP 321.5) and S. Ave Del Sol (MP 322.5), and SR 80 between SR 90 (MP 333) and US 191 (MP 366).

Bicycle traffic is permitted on the mainline outside shoulder and on SR 90 between I-10 and Sierra Vista where effective shoulder widths are typically greater than the preferred 4-foot minimum width. Within Sierra Vista there are shared use paths on SR 90 between the SR 90 Bypass/Hatfield Road (MP 317) and 7th Street (MP 318.6) and between SR 92 (MP 321.5) and just east of Colonia De Salud (MP 323). East of Sierra Vista, SR 90 and SR 80 shoulder widths vary, with some areas having rumble strips that can reduce the rideable area for bicyclists. SR 80 approaching the Douglas area from MP 358 to MP 366, has wider outside shoulders that are approximately 10 feet wide.

[1] Source: Arizona State Rail Plan (2011), page 102

Bus/Transit
Vista Transit, the transit service for the Sierra Vista area, offers five bus routes which run Monday through Friday, and two routes which run on Saturday only. Two of the weekday bus routes have stops on SR 90. The City of Douglas operates the Douglas Rides service, which is a deviated fixed route service within the City of Douglas and surrounding communities. The City of Douglas also operates the Bisbee Bus transit system, which services the communities of Old Bisbee, San Jose, Naco, Saginaw, and Warren on northbound route and southbound routes. Greyhound operates intercity bus transit along I-10 in Arizona, with a stop in Benson.

Aviation
There are several general aviation facilities in proximity to the SR 90/SR 80 corridor. These include the Sierra Vista Municipal Airport, which is jointly operated by the U.S Army as Libby Army Airfield, and the Bisbee-Douglas International Airport, owned by Cochise County. Other public use airports in the area include the Douglas Municipal Airport, Bisbee Municipal Airport, and the Cochise College Airport, which is also used by Cochise College's aviation program.

Land Ownership, Land Uses and Jurisdictions
As shown previously in **Figure 2**, the SR 90/SR 80 corridor traverses Cochise County and multiple jurisdictions and land. Land ownership in Benson, Sierra Vista, Bisbee, and Douglas urban areas is mainly private, with much of the corridor (SR 90 and SR 80) traversing a mix of private land and State Trust Land. East of Sierra Vista, the San Pedro Riparian area, owned by the Bureau of Land Management (BLM), crosses SR 90.

Population Centers
Population centers of various sizes exist along the SR 90/SR 80 corridor. **Table 2** provides a summary of the populations for communities along the corridor. Projected population growth varies between 2010 and 2040 in the major population centers along the corridor according to the Arizona State Demographer's Office. Benson is projected to grow 30 percent during this time period, while Bisbee and Huachuca City are projected to have a small loss in population.

Table 3: Current and Future Population

Community	2010 Population	2015 Population	2040 Population	% Change 2010-2040	Total Growth
Cochise County	131,346	129,112	148,998	13%	17,652
Benson	5,105	4,999	6,629	30%	1,524
Bisbee	5,575	5,297	5,213	-6%	-362
Douglas	17,378	16,956	18,138	4%	760
Huachuca City	1,853	1,794	1,671	-10%	-192
Sierra Vista	43,888	44,183	50,649	15%	6,761

Source: U.S. Census, Arizona Department of Administration – Employment and Population Statistics

Major Traffic Generators
The city of Sierra Vista, along with the cities of Bisbee, Benson, and Douglas, and Kartchner Caverns State Park, are major traffic generators for the SR 90/SR 80 corridor.

Tribes
There are no tribal reservation areas near this corridor.

Wildlife Linkages
The Arizona State Wildlife Action Plan (SWAP) provides a 10-year vision for the entire state, identifying wildlife and habitats in need of conservation, insight regarding the stressors to those resources, and actions that can be taken to alleviate those stressors. Using the Habimap Tool that creates an interactive database of information included in the SWAP, the following were identified in relation to the SR 90/SR 80 corridor:

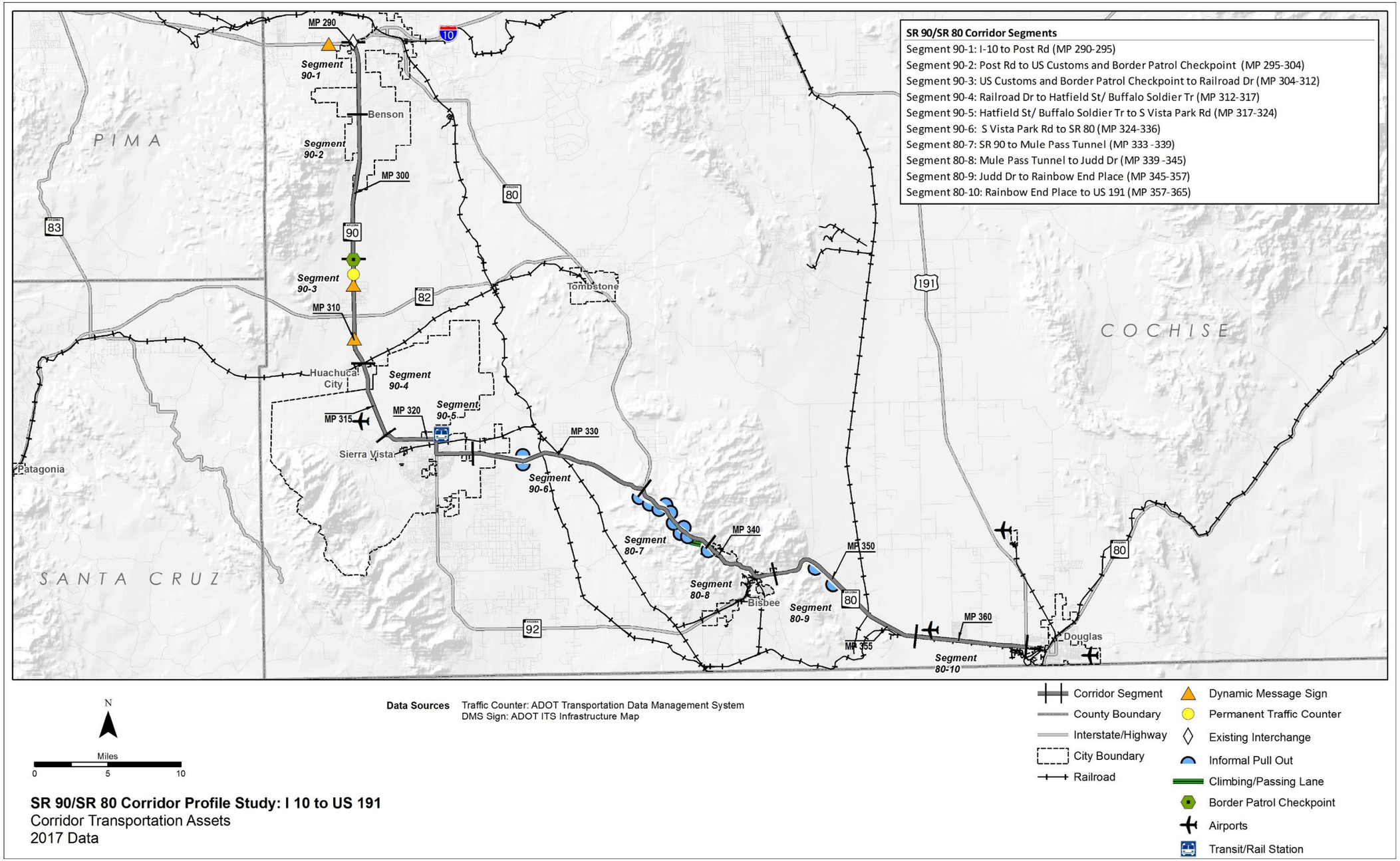
- Arizona Game and Fish Department (AGFD) Wildlife Waters were not identified near the corridor.
- Arizona Important Bird Areas: The San Pedro Riparian National Conservation Area, which crosses SR 90 east of Moson Road, approximately between MP 327 and 330, is an Important Bird Area
- The corridor travels through allotments controlled by the Arizona State Land Department (ASLD).
- Riparian areas include crossings along SR 90 approximately from MP 311 to MP 312 and MP 328 to MP 329. On SR 80 there are riparian areas on the south side of SR 80 near MP 335.
- Arizona Wildlife Linkages: No missing linkages are noted, but there are potential Arizona Wildlife Linkage Zones along SR 90 from MP 295 to MP 302 (linking the Coronado National Forest to the San Pedro Riparian Area) and between MP 314 to MP 321.
- According to the Species and Habitat Conservation Guide (SHCG), sensitive habitats that have moderate to high conservation potential exist along much of the corridor; with the exception of the City of Sierra Vista, the Bisbee area on SR 80 between MP 341 and 343, and other scattered areas.
- Areas where Species of Greatest Conservation Need (SGCN) are high or moderately vulnerable are located along SR 90, from approximately MP 291 to MP 314, and from MP 327 to 336, as well as along much of the SR 80 corridor from MP 333 to MP 366, with the exception of the Bisbee area between MP 341 and 343.
- Identified areas of moderate or high levels of Species of Economic and Recreational Importance (SERI) are similar to the SHCG habitat areas noted above.

Corridor Assets

Corridor transportation assets are summarized in **Figure 3**. There is one passing lane section on SR 80 between MP 337 and MP 338. The corridor includes one grade-separated traffic interchange (TI) at I-10 and SR 90, at the northern terminus of the corridor area at MP 289. A United States Customs and Enforcement Border Patrol Check Point is located on SR 90 NB MP 304.5.

Other assets include dynamic message signs (DMS) located SR 90 NB, MP 309.9, and SB at MP 306.4; informal pull-off areas along the southern portion of the corridor; 12 ADOT traffic signals along SR 90; one ADOT traffic signal along SR 80; and one permanent traffic counter on SR 90 at MP 305.6. Vista Transit runs routes in Sierra Vista.

Figure 3: Corridor Assets



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Corridor Transportation Assets
2017 Data

1.6 Corridor Stakeholders and Input Process

A Technical Advisory Committee (TAC) was created that was comprised of representatives from key stakeholders. TAC meetings were held at key milestones to present results and obtain feedback. In addition, several meetings were conducted with key stakeholders in July 2017 to present the results and obtain feedback.

Key stakeholders identified for this study included:

- ADOT Southcentral District
- ADOT Southeast District
- ADOT Technical Groups
- SEAGO
- SVMPO
- AGFD
- ASLD
- Federal Highway Administration (FHWA)

1.7 Prior Studies and Recommendations

This study identified recommendations from previous studies, plans, and preliminary design documents. Studies, plans, and programs pertinent to the SR 90/SR 80 corridor were reviewed to understand the full context of future planning and design efforts within and around the study area. These studies are organized below into four categories: Framework and Statewide Studies, Regional Planning Studies, Planning Assistance for Rural Areas (PARAs) and Small Area Transportation Studies (SATS), and Design Concept Reports (DCRs) and Project Assessments (PAs).

Framework and Statewide Studies

- ADOT Bicycle and Pedestrian Plan Update (2013)
- ADOT Pedestrian Safety Action Plan (2017)
- ADOT Five-Year Transportation Facilities Construction Program (2018 – 2022)
- ADOT Climbing and Passing Lane Prioritization Study (2015)
- ADOT Arizona Key Commerce Corridors (2014)
- ADOT Arizona Multimodal Freight Analysis Study (2009)
- ADOT Arizona Ports of Entry Study (2013)
- ADOT Arizona State Airport Systems Plan (2008)
- ADOT Arizona State Freight Plan (2016)
- ADOT Arizona State Rail Plan (2011)
- AGFD Arizona State Wildlife Action Plan (2012) / Arizona Wildlife Linkages Assessment
- ADOT Arizona Statewide Dynamic Message Sign Master Plan (2011)
- ADOT Arizona Statewide Rail Framework Study (2010)
- ADOT Arizona Statewide Rest Area Study (2011)
- ADOT Arizona Statewide Shoulders Study (2015)
- ADOT Arizona Strategic Highway Safety Plan (2014)
- ADOT Arizona Roadway Departure Safety Implementation Plan (RDSIP) (2014)
- ADOT AASHTO U.S. Bicycle Route System (2015)
- ADOT Low Volume State Routes Study (2017)
- ADOT Statewide Transportation Planning Framework – Building a Quality Arizona (BQAZ) (2010)
- ADOT What Moves You Arizona? Long-Range Transportation Plan (2010-2035)

Regional Planning Studies

- Arizona-Sonora Border Master Plan (February 2013)
- Sierra Vista MPO Regional Transportation Plan, 2015-2040 (2015)
- Sierra Vista MPO Transportation Improvement Program, Fiscal Year 2017-2021
- Sierra Vista MPO Origin and Destination Study (2017)
- Southeastern Arizona Regional Transportation Coordination Plan Update 2016-2017
- SEAGO Region 2017-2021 Transportation Improvement Program
- 2012 Regional Mobility Management Plan for the SEAGO Region – Graham, Greenlee, Cochise, and Santa Cruz Counties (2012)
- SR-80 and SR-191 Oversize Load Study Final Report and Executive Summary (2013)

Planning Assistance for Rural Areas and Small Area Transportation Studies

- City of Benson Small Area Transportation Study (2007)
- City of Bisbee Comprehensive Transportation Plan (2013)
- City of Douglas Small Area Transportation Study (2007)
- City of Sierra Vista Safe Bicycle and Pedestrian Routes Plan (2011)
- Northwest Cochise County Long-Range Transportation Plan Final Report (2010)
- Sierra Vista Small Area Transportation Study (2003)
- Sierra Vista Transportation Efficiency Study (2013)
- 2040 Long-Range Transportation Plan Final Report (2015)

Design Concept Reports and Project Assessments

- SR 80: MP 356.37 to 356.73 Construct Left and Right Turn Lanes Final Project Assessment (2002)
- SR 90 Bypass-Sierra Vista Shared Use Path: Fort Huachuca East Gate Spur to Seventh Street Final Project Assessment (2003)

- SR 90 Sierra Vista: SR 92 to Central Avenue, Final Project Assessment (2009)
- SR 90 Sierra Vista: SR 92 to Central Avenue, Addendum Number 1 to Final Project Assessment (2010)
- SR 90 Widening Project, Central Avenue to Moson Road, Final Project Assessment (2008)
- Davis Road – SR 80 to Central Highway: Final Project Assessment (2016)

Summary of Prior Recommendations

Various studies and plans have recommended improvements to the SR 90/SR 80 corridor as shown in **Table 3** and **Figure 4**. They include, but are not limited to:

- Widening of numerous sections of SR 90/SR 80, some of which will require right-of-way acquisition; many other proposed improvements are associated with the recommended widening:
  - Adding one general purpose lane in each direction on SR 90 from MP 290 to MP 336
  - Adding one general purpose lane in each direction on SR 80 from MP 345 to MP 357
- Perform and implement findings of an access management plan on SR 90 from MP 290 to MP 299
- Install edge line or shoulder rumble strips on numerous segments of SR 90 between MP 290 and MP 335
- Climbing and passing lanes have been recommended in two areas on the SR 90 corridor and two areas on the SR 80 corridor
- Two areas on SR 80 were recommended for further study as potential truck escape ramp locations
- Several intersections on SR 90 and SR 80 have recommendations for studies to be performed or recommendations from studies that should be implemented
- One dynamic message sign is recommended on SR 90 at MP 296.7 southbound
- Two bridge rehabilitation projects are recommended on SR 80 at MP 352.4 and MP 364
- Construct shoulder improvements on several segments on both SR 90 and SR 80
- Install centerline rumble strips on SR 90 between MP 310 and 320
- Install alignment delineation and lighting at 9 locations on SR 90 between MP 293 and MP 331
- The extension of Chino Road to SR 80 will make the SR 80/Chino Road signalized intersection a four-legged intersection
- Construct bicycle lanes on SR 90, between MP 317 and 322
- Widen sidewalk on SR 80 between MP 340 and MP 343
- Transit improvements:
  - Construct a bus pullout on both sides of SR 90, approximately MP 322
  - Implement intercity bus service that connects the Douglas and Bisbee bus systems to the Sierra Vista (Vista Transit) bus system
  - Implement intercity Bus Service that connects the Sierra Vista (Vista Transit) bus system to the Greyhound Bus System in Benson, Arizona
  - Implement intercity bus service between Benson, Sierra Vista, Bisbee, Douglas, and Tombstone
  - Construct a minor transit center in Benson and Douglas

Table 4: Corridor Recommendations from Previous Studies

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization[M], Expansion [E])			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
SR 90											
1	290	294	4	Widen SR 90 to 6 lanes between I-10 and Post Ranch Road			√	-	N/A	N	Northwest Cochise County Long Range Transportation Plan (2010)
2	290	336	46	Widen/upgrade SR 90 to 6 lanes/4 lanes, I-10 to SR 80			√	-	N/A	N	BQAZ 2010 Statewide Transportation Planning Framework Final Report (2010) Sierra Vista Small Area Transportation Study (2003) – widening SR 90 from Campus Dr to Fry Blvd within the CPS area
3	290	299	9	Conduct and implement findings of an access management plan for SR 90 from I-10 (MP 290) to Kartchner Caverns State Park entrance, MP 298.5		√		-	N/A	N	City of Benson Small Area Transportation Study (2007)
4	290	309	19	Install edge line rumble strips or shoulder rumble strips recommended in 20 segments between MP 290 and 309. Alignment delineation and lighting is recommended between MP 292.5-293, MP 295.5-296, MP 298.5-299, MP 305-305.5, MP 307-307.5		√		-	N/A	N	ADOT Arizona Roadway Departure Safety Implementation Plan (2014)
5	291	N/A	-	Construct a traffic signal at SR 90/Jenella Road (developer project), MP 290.7		√		-	N/A	N	City of Benson Small Area Transportation Study (2007)
6	294	N/A	-	Construct traffic signal at SR 90/Post Road/Post Ranch Rd (listed as a developer project)		√		-	N/A	N	City of Benson Small Area Transportation Study (2007)
7	297	N/A	-	Construct dynamic message sign at MP 296.7 SB		√		-	N/A	N	Arizona Dynamic Message Sign (DMS) Master Plan (2011)
8	310	323		Centerline rumble strips recommended between MP 310-320. Edge line rumble strips or shoulder rumble strips recommended in 7 segments between MP 310-323. Alignment delineation and lighting are recommended between MP 311-311.5, MP 317.5-318, MP 320.5-321		√		-	N/A	N	ADOT Arizona Roadway Departure Safety Implementation Plan (2014)
9	317	N/A	-	Construct additional turn lanes at SR 90/SR 90 Bypass/Hatfield Street intersection at MP 317.2		√		2017	H880301C	N	2017-2021 Five Year Facilities Construction Program Sierra Vista MPO Regional Transportation Plan 2015-2040 (2016) Sierra Vista MPO Transportation Improvement Program, FY 2017-2021

Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization[M], Expansion [E])			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
10	317	322	4	Construct bicycle lanes on the SR 90 bypass from Buffalo Soldier Trail (MP 317.2) to the SR 90/SR 92 intersection (MP 321.5)		√		-	N/A	N	City of Sierra Vista Safe Bicycle and Pedestrian Routes Plan (2011)
11	320	321	1	Conduct and implement the findings of a Road Safety Assessment with emphasis on pedestrian safety issues		√		-	N/A	N	Pedestrian Safety Action Update (2017)
12	321	323	2	Evaluate street lighting on SR 90 from Campus Drive (MP 321) to South Avenue Del Sol (MP 322.5)		√		-	N/A	N	Pedestrian Safety Action Update (2017)
13	322	324	2	Widen SR 90 from a five-lane undivided cross section at the SR 90/SR 92 intersection (MP 321.5) to a six-lane divided cross section east of Central Avenue (MP 323.9) 2003 SATS included bypass route alternatives which would extend SR 90 east of SR 92, connecting to SR 90 at a point at or east of Moson Road.			√	-	N/A	N	SR 90 Sierra Vista: SR 92 to Central Avenue, Final Project Assessment (2009) and Addendum (2010) Sierra Vista SATS (2003) (median, bypass route)
14	321.6	N/A	-	Construct a bus pullout eastbound		√		-	N/A	N	Sierra Vista MPO Regional Transportation Plan 2015-2040 (2016)
15	321.6	N/A	-	Construct bus pullout westbound		√		-	N/A	N	Sierra Vista MPO Regional Transportation Plan 2015-2040 (2016)
16	323	336	13	Construct shoulder improvements (both directions) on four segments between MP 323-332 and MP 334-336.4		√		-	N/A	N	ADOT Statewide Shoulders Study (2015)
17	324	325	2	Widen two-lane roadway to a four-lane divided cross section from MP 323.7 to MP 325.3			√	-	N/A	N	SR 90 Widening Project, Central Avenue to Moson Road, Final Project Assessment (2008)
18	329	327	2	Construct climbing lane on SR 90 WB from MP 329 to 327			√	-	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
19	329	335	6	Construct edge line rumble strips or shoulder rumble strips between MP 329-329.5, MP 330-330.5, MP 334.5-335. Construct alignment delineation and lighting between MP 330-330.5		√		-	N/A	N	ADOT Arizona Roadway Departure Safety Implementation Plan (2014)

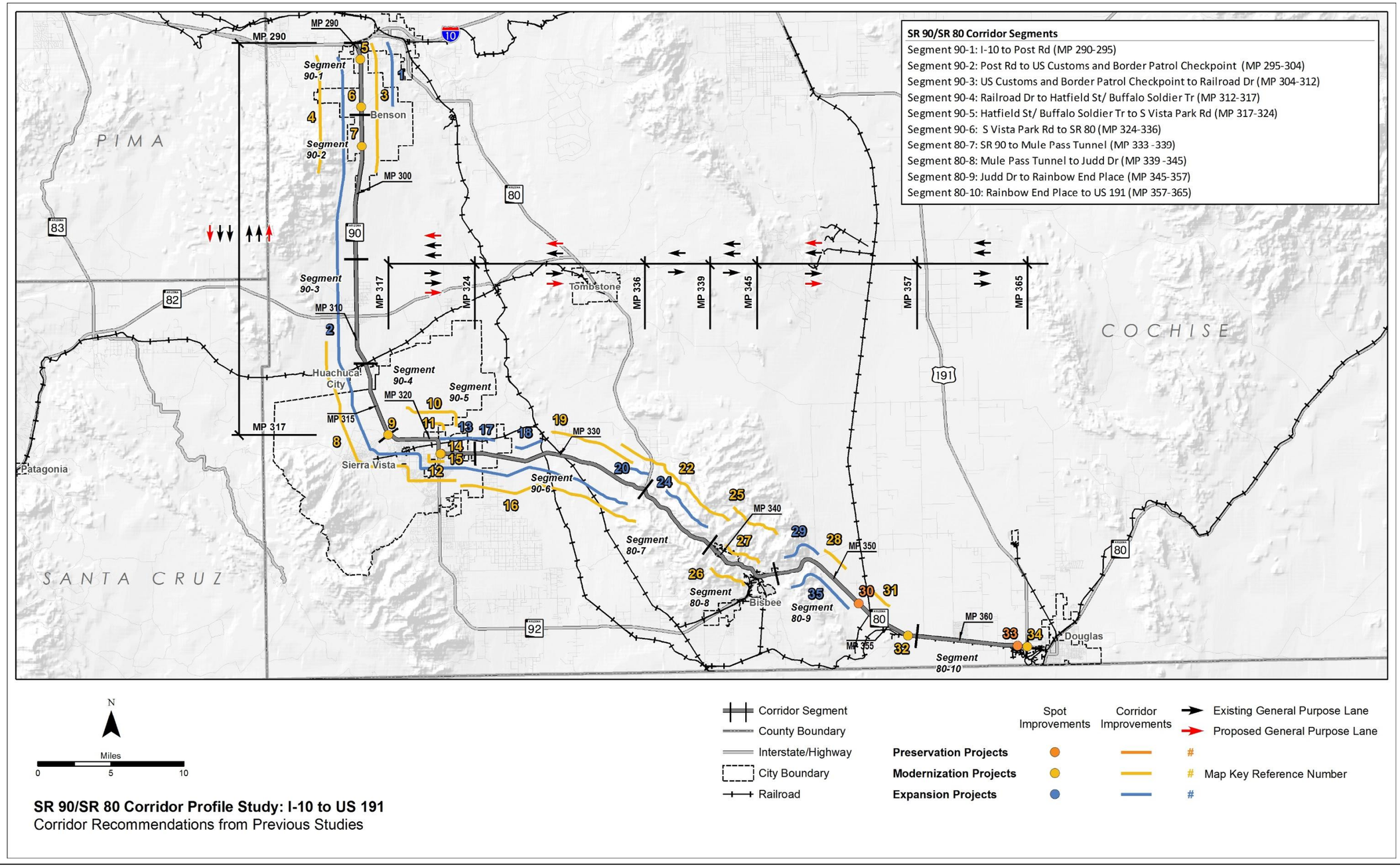
Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization[M], Expansion [E])						Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
20	335	337	2	Construct climbing lane on SR 90 EB from MP 335 to 337 (note: CPS limits go to MP 336)			√	-	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
21	N/A	N/A	-	Provide a minor transit center in Benson (note – not shown on Figure 4)		√		-	N/A	N	BQAZ 2010 Statewide Transportation Planning Framework Final Report (2010)
SR 80											
22	332	339	7	Westbound area noted as an area to study in greater detail as a potential location for a truck escape ramp.		√		-	N/A	N	ADOT Truck Escape Ramp Study (2003)
23	334	339	2	Construct shoulder improvements (both directions), MP 334-336 and MP 336-339		√		-	N/A	N	ADOT Statewide Shoulders Study (2015)
24	334	338	4	Construct climbing lane on SR 80 EB from MP 334 to MP 338			√	-	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
25	339	344	5	Eastbound area noted as an area to study in greater detail as a potential location for a truck escape ramp.		√		-	N/A	N	ADOT Truck Escape Ramp Study (2003)
26	340	343	3	Widen sidewalk on south side of SR 80 from Old Bisbee to SR 92		√		-	N/A	N	City of Bisbee Comprehensive Transportation Plan (2012)
27	340	343	3	Construct signage and wayfinding information, including warning flashers, on SR 80 from approximately Mule Pass Tunnel to SR 92		√		-	N/A	N	City of Bisbee Comprehensive Transportation Plan (2012)
28	348	350		Construct shoulder improvements (both directions), MP 348-350				-	N/A	N	ADOT Statewide Shoulders Study (2015)
29	349	346	3	Construct passing lane on SR 80 WB between MP 346-349			√	-	N/A	N	Climbing and Passing Lane Prioritization Study (2015)
30	352	N/A	-	Rehabilitate Glance Creek Bridge (ADOT Structure No. 237), MP 352.38	√			2019	H891401C	N	SR 80 and SR 191 Oversize Load Study (2013) 2017-2021 Five -Year Transportation Facilities Construction Program Tentative 2018-2022 Five-Year Transportation Facilities Construction Program
31	352	354		Construct shoulder improvements (both directions), MP 352-354		√		-	N/A	N	ADOT Statewide Shoulders Study (2015)

Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization[M], Expansion [E])			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
32	356	-	-	Construct left and right turn lanes at the SR 80/Paul Spur Road intersection		√		-	N/A	N	SR 80, MP 356.37 to 356.73 Construct Left and Right Turn Lanes, Final Project Assessment (2002)
33	364	N/A	-	Construct White Water Draw Bridge scour retrofit and deck rehabilitation (ADOT Structure No.1626)	√			2018	H854901C	N	2017-2021 Five -Year Transportation Facilities Construction Program Tentative 2018-2022 Five-Year Transportation Facilities Construction Program
34	365	N/A	-	Realign Chino Rd at SR 80 and update to ADOT standards. Part of Chino Road Extension, Phase 2, 9th St to SR 90 by City of Douglas, MP 364.7		√		-	DGS17-01	N	Arizona-Sonora Border Master Plan (2013) Douglas Strategic Motor Carrier Safety Inspection Station Circulation Study (2003) SEAGO 2017-2021 TIP 2040 Cochise County Long-Range Transportation Plan
35	345	357	12	Widen SR 80 to 4 lanes between MP 345 to MP 357			√	-	N/A	N	BQAZ 2010 Statewide Transportation Planning Framework
36	N/A	N/A	-	Provide intercity bus service that connects the Douglas and Bisbee bus systems to the Sierra Vista (Vista Transit) bus system (note – not shown on Figure 4)		√		-	N/A	N	SEAGO 2016-2017 Transportation Coordination Plan Update Sierra Vista MPO Origin-Destination Study (2017)
37	N/A	N/A	-	Intercity Bus Service that connects the Sierra Vista (Vista Transit) bus system to the Greyhound Bus System in Benson, Arizona (note – not shown on Figure 4)		√		-	N/A	N	SEAGO 2016-2017 Transportation Coordination Plan Update
38	N/A	N/A	-	Provide intercity bus service between Benson, Sierra Vista, Bisbee, Douglas, and Tombstone (note – not shown on Figure 4)		√		-	N/A	N	BQAZ 2010 Statewide Transportation Planning Framework
39	N/A	N/A	-	Provide a minor transit center in Douglas (note – not shown on Figure 4)		√		-	N/A	N	BQAZ 2010 Statewide Transportation Planning Framework

Figure 4: Corridor Recommendations from Previous Studies



SR 90/SR 80 Corridor Profile Study: I-10 to US 191
Corridor Recommendations from Previous Studies

2.0 CORRIDOR PERFORMANCE

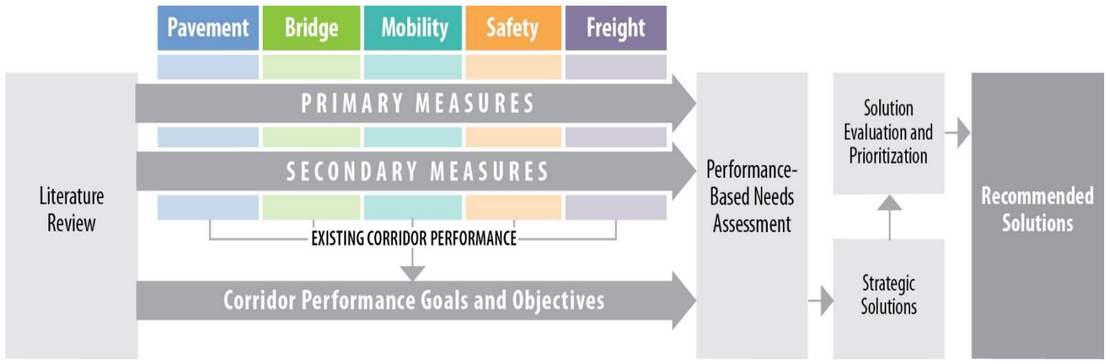
This chapter describes the evaluation of the existing performance of the SR 90/SR 80 corridor. A series of performance measures is used to assess the corridor. The results of the performance evaluation are used to define corridor needs relative to the long-term goals and objectives for the corridor.

2.1 Corridor Performance Framework

This study uses a performance-based process to define baseline corridor performance, diagnose corridor needs, develop corridor solutions, and prioritize strategic corridor investments. In support of this objective, a framework for the performance-based process was developed through a collaborative process involving ADOT and the CPS consultant teams.

Figure 5 illustrates the performance framework, which includes a two-tiered system of performance measures (primary and secondary) to evaluate baseline performance. The primary measures in each of five performance areas are used to define the overall health of the corridor, while the secondary measures identify locations that warrant further diagnostic investigation to delineate needs. Needs are defined as the difference between baseline corridor performance and established performance objectives.

Figure 5: Corridor Profile Performance Framework



The following five performance areas guide the performance-based corridor analyses:

- Pavement
- Bridge
- Mobility
- Safety
- Freight

These performance areas reflect national performance goals stated in *Moving Ahead for Progress in the 21st Century* (MAP-21):

- Safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition: To maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction: To achieve a significant reduction in congestion on the National Highway System
- System Reliability: To improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality: To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment
- Reduced Project Delivery Delays: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion

The MAP-21 performance goals were considered in the development of ADOT's P2P process, which integrates transportation planning with capital improvement programming and project delivery. Because the P2P program requires the preparation of annual transportation system performance reports using the five performance areas adopted for the CPS, consistency is achieved in the performance measures used for various ADOT analysis processes.

The performance measures include five primary measures: Pavement Index, Bridge Index, Mobility Index, Safety Index, and Freight Index. Additionally, a set of secondary performance measures provides for a more detailed analysis of corridor performance.

Each of the primary and secondary performance measures is comprised of one or more quantifiable indicators. A three-level scale was developed to standardize the performance scale across the five performance areas, with numerical thresholds specific to each performance measure:

Good/Above Average Performance – Rating is above the identified desirable/average range

Fair/Average Performance – Rating is within the identified desirable/average range

Poor/Below Average Performance – Rating is below the identified desirable/average range

Table 4 provides the complete list of primary and secondary performance measures for each of the five performance areas.

Table 4: Corridor Performance Measures

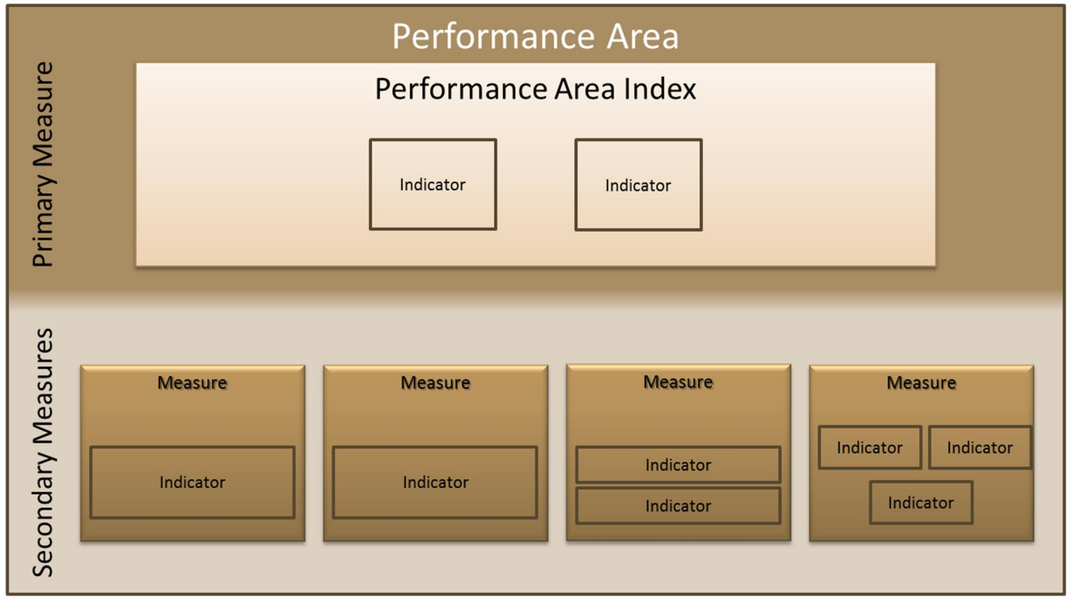
Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index and cracking	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure and structural evaluation rating	• Bridge Sufficiency • Functionally Obsolete Bridges • Bridge Rating • Bridge Hot Spots
Mobility	**Mobility Index** Based on combination of existing and future daily volume-to-capacity ratios	• Future Congestion • Peak Congestion • Travel Time Reliability • Multimodal Opportunities
Safety	**Safety Index** Based on frequency of fatal and incapacitating injury crashes	• Directional Safety Index • Strategic Highway Safety Plan Emphasis Areas • Crash Unit Types • Safety Hot Spots
Freight	**Freight Index** Based on bi-directional truck planning time index	• Recurring Delay • Non-Recurring Delay • Closure Duration • Bridge Vertical Clearance • Bridge Vertical Clearance Hot Spots

The general template for each performance area is illustrated in **Figure 6**.

The guidelines for performance measure development are:

- Indicators and performance measures for each performance area should be developed for relatively homogeneous corridor segments
- Performance measures for each performance area should be tiered, consisting of primary measure(s) and secondary measure(s)
- Primary and secondary measures should assist in identifying those corridor segments that warrant in-depth diagnostic analyses to identify performance-based needs and a range of corrective actions known as solution sets
- One or more primary performance measures should be used to develop a Performance Index to communicate the overall health of a corridor and its segments for each performance area; the Performance Index should be a single numerical index that is quantifiable, repeatable, scalable, and capable of being mapped; primary performance measures should be transformed into a Performance Index using mathematical or statistical methods to combine one or more data fields from an available ADOT database
- One or more secondary performance measure indicators should be used to provide additional details to define corridor locations that warrant further diagnostic analysis; secondary performance measures may include the individual indicators used to calculate the Performance Index and/or “hot spot” features

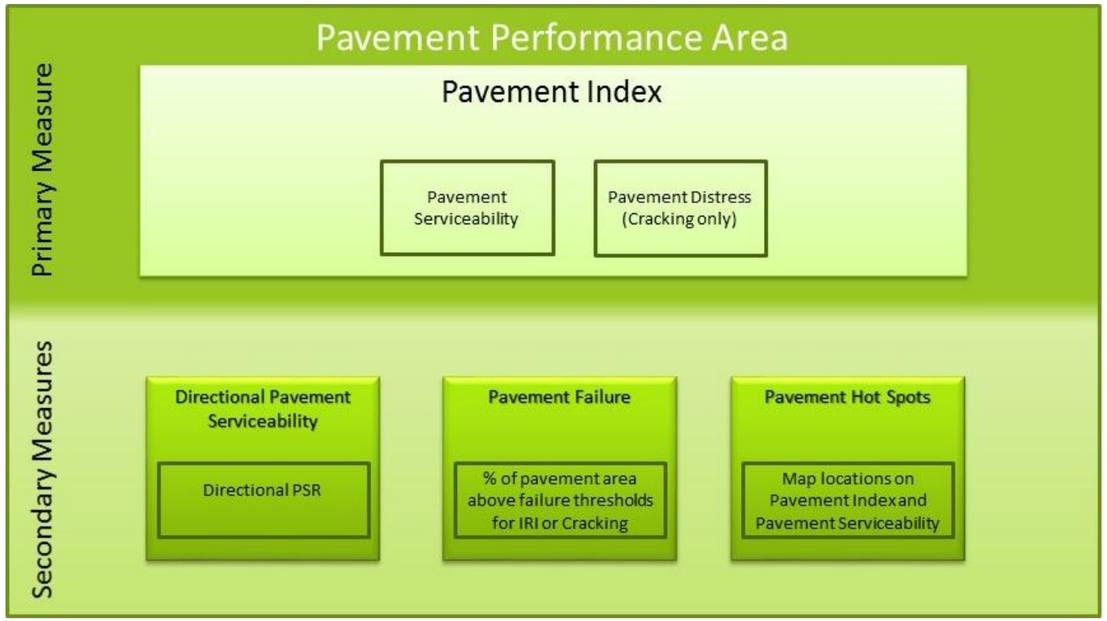
Figure 6: Performance Area Template



2.2 Pavement Performance Area

The Pavement performance area consists of a primary measure (Pavement Index) and three secondary measures, as shown in **Figure 7**. These measures assess the condition of the existing pavement along the SR 90/SR 80 corridor. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 7: Pavement Performance Measures



Primary Pavement Index

The Pavement Index is calculated using two pavement condition ratings: the Pavement Serviceability Rating (PSR) and the Pavement Distress Index (PDI).

The PSR is extracted from the International Roughness Index (IRI), a measurement of pavement roughness based on field-measured longitudinal roadway profiles. The PDI is extracted from the Cracking Rating (CR), a field-measured sample from each mile of highway.

Both the PSR and PDI use a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest. The Pavement Index for each segment is a weighted average of the directional ratings based on the number of travel lanes. Therefore, the condition of a section with more travel lanes will have a greater influence on the resulting segment Pavement Index than the condition of a section with fewer travel lanes.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Pavement performance area, the relevant operating environments are designated as interstate and non-interstate segments. For the SR 90/SR 80 corridor, the following operating environment was identified:

- Non-interstate: all segments

Secondary Pavement Measures

Three secondary measures provide an in-depth evaluation of the different characteristics of pavement performance.

Directional Pavement Serviceability

- Weighted average (based on number of lanes) of the PSR for the pavement in each direction of travel

Pavement Failure

- Percentage of pavement area rated above failure thresholds for IRI or Cracking

Pavement Hot Spots

- A Pavement "hot spot" exists where a given one-mile section of roadway rates as being in "poor" condition
- Highlights problem areas that may be under-represented in a segment average; this measure is recorded and mapped, but not included in the Pavement performance area rating calculations

Pavement Performance Results

The Pavement Index provides a high-level assessment of the pavement condition for the corridor and for each segment. The three secondary measures provide more detailed information to assess pavement performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Pavement Index shows "good" overall performance for the SR 90/SR 80 corridor
- According to the Pavement Index, nearly all of the pavement is in "good" condition with the exception of Segments 90-5, 80-7, and 80-8 which show either "fair" or "poor" condition
- Segments 90-5, and 80-7 show "poor" % Area Failure ratings
- The weighted average of the % Area Failure shows "fair" overall performance for the SR 90/80 corridor
- The weighted average of the Directional PSR shows "good" overall performance for the SR 90/SR 80 corridor
- Pavement hot spots along the corridor include:
    - Segment 90-3 southbound (SB)/eastbound (EB) MP 311-312
    - Segment 90-4 MP 312-313

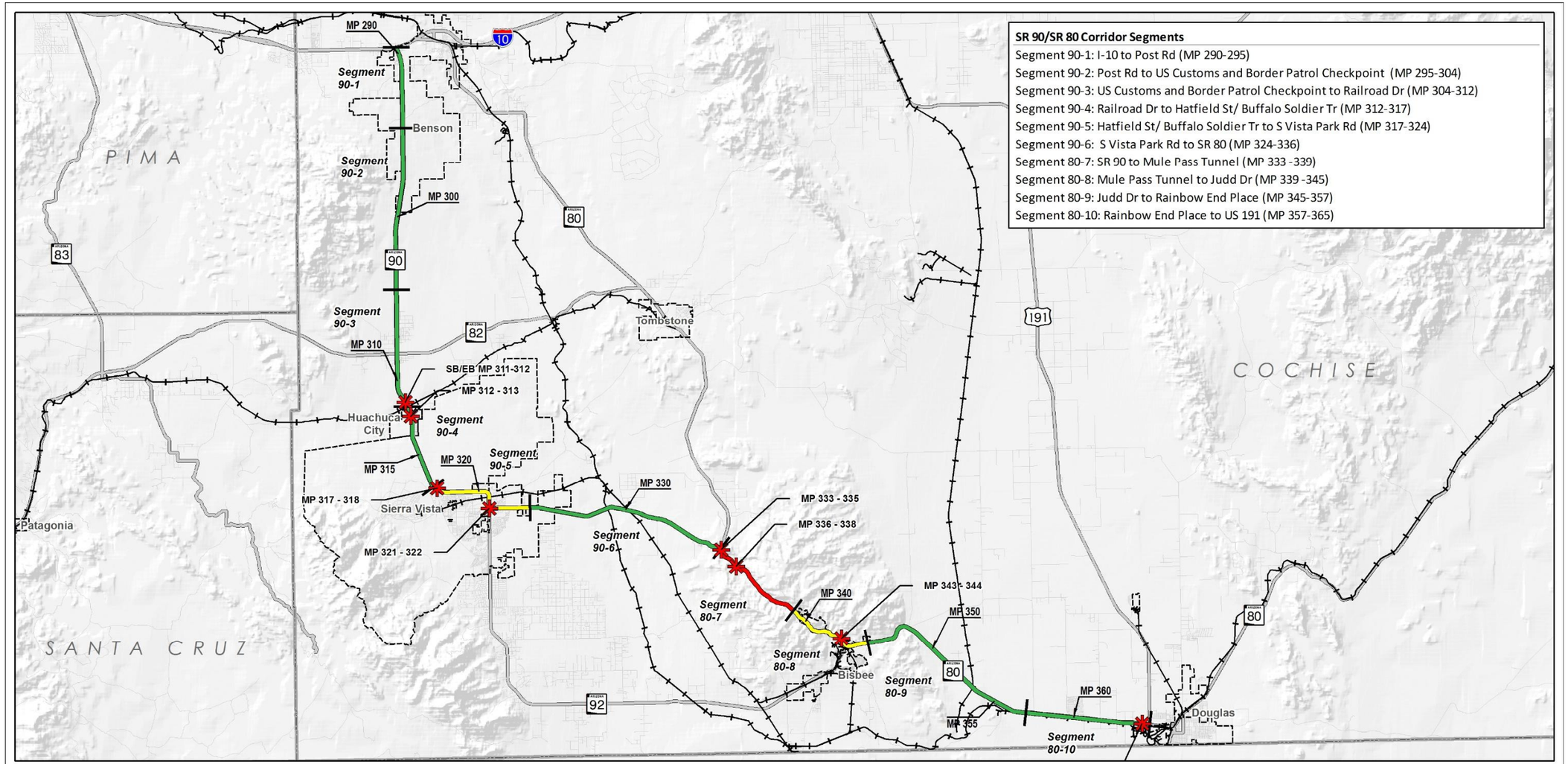
- Segment 90-5 MP 317-318, MP 321-322
- Segment 80-7 MP 333-335, MP 336-338
- Segment 80-8 MP 343-344
- Segment 80-10 northbound (NB)/westbound (WB) MP 364-365

Table 5 summarizes the Pavement performance results for the SR 90/SR 80 corridor. **Figure 8** illustrates the primary Pavement Index performance and locations of Pavement hot spots along the SR 90/SR 80 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 5: Pavement Performance

Segment #	Segment Length (miles)	Pavement Index	Directional PSR		% Area Failure
			SB/EB	NB/WB	
90-1	5	4.10	4.16	4.17	0%
90-2	9	4.30	4.33	4.14	0%
90-3	8	3.72	3.59	3.39	6%
90-4	5	3.56	3.28		20%
90-5	7	3.14	3.11		29%
90-6	12	3.74	3.55		0%
80-7	6	2.31	4.24		67%
80-8	6	3.35	3.10		17%
80-9	12	3.98	3.82		0%
80-10	8	3.76	3.64	3.69	6%
Weighted Corridor Average		3.66	3.70	3.66	11%
SCALES					
Performance Level		**Non-Interstate**			
Good		> 3.50			< 5%
Fair		2.90 - 3.50			5% - 20%
Poor		< 2.90			> 20%

Figure 8: Pavement Performance

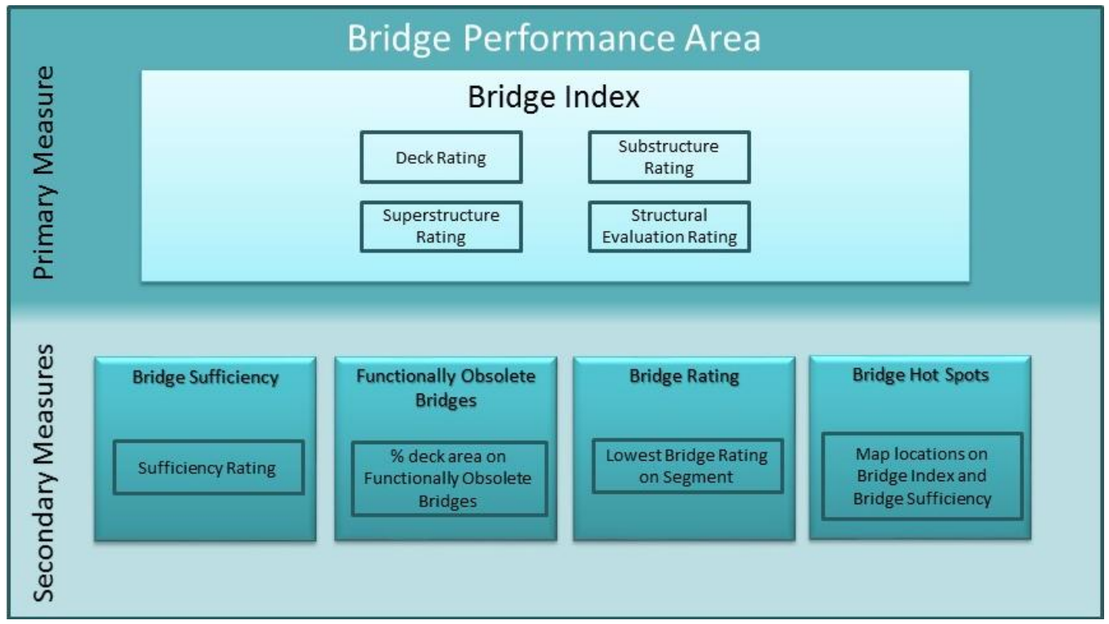


SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Pavement Index and Hot Spots
2015-2016 Data

2.3 Bridge Performance Area

The Bridge performance area consists of a primary measure (Bridge Index) and four secondary measures, as shown in **Figure 9**. These measures assess the condition of the existing bridges along the SR 90/SR 80 corridor. Only bridges that carry mainline traffic or bridges that cross the mainline are included in the calculation. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 9: Bridge Performance Measures



Primary Bridge Index

The Bridge Index is calculated based on the use of four different bridge condition ratings from the ADOT Bridge Database, also known as the Arizona Bridge Information and Storage System (ABISS). The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating. These ratings are based on inspection reports and establish the structural adequacy of each bridge. The performance of each individual bridge is established by using the lowest of these four ratings. The use of these ratings, and the use of the lowest rating, is consistent with the approach used by the ADOT Bridge Group to assess the need for bridge rehabilitation. The Bridge Index is calculated as a weighted average for each segment based on deck area.

Secondary Bridge Measures

Four secondary measures provide an in-depth evaluation of the characteristics of each bridge:

Bridge Sufficiency

- Multipart rating includes structural adequacy and safety factors as well as functional aspects such as traffic volume and length of detour
- Rates the structural and functional sufficiency of each bridge on a 100-point scale

Functionally Obsolete Bridges

- Percentage of total deck area in a segment that is on functionally obsolete bridges
- Identifies bridges that no longer meet standards for current traffic volumes, lane width, shoulder width, or bridge rails
- A bridge that is functionally obsolete may still be structurally sound

Bridge Rating

- The lowest rating of the four bridge condition ratings (substructure, superstructure, deck, and structural evaluation) on each segment
- Identifies lowest performing evaluation factor on each bridge

Bridge Hot Spots

- A Bridge “hot spot” is identified where a given bridge has a bridge rating of 4 or lower or multiple ratings of 5 between the deck, superstructure, and substructure ratings
- Identifies particularly low-performing bridges or those that may decline to low performance in the immediate future

Bridge Performance Results

The Bridge Index provides a high-level assessment of the structural condition of bridges for the corridor and for each segment. The four secondary measures provide more detailed information to assess bridge performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Bridge Index shows “fair” overall performance for the SR 90/SR 80 corridor
- Segments 90-1, 90-4, and 90-5 contain no bridges
- All segments that contain bridges have a “fair” or “good” Bridge Index rating
- All segments that contain bridges have a “good” Sufficiency Rating except Segments 80-7 and 80-9, which have a “fair” Sufficiency Rating
- There are two functionally obsolete bridges along the corridor: Tombstone Canyon Bridge 1 #480 at MP 333.27 and Brewery Gulch TI OP #670 at MP 341.42.
- All segments that contain bridges have a “fair” Lowest Bridge Rating measure
- The corridor includes three bridge hot spots:
    - Lewis Springs OP (#470), MP 328.85

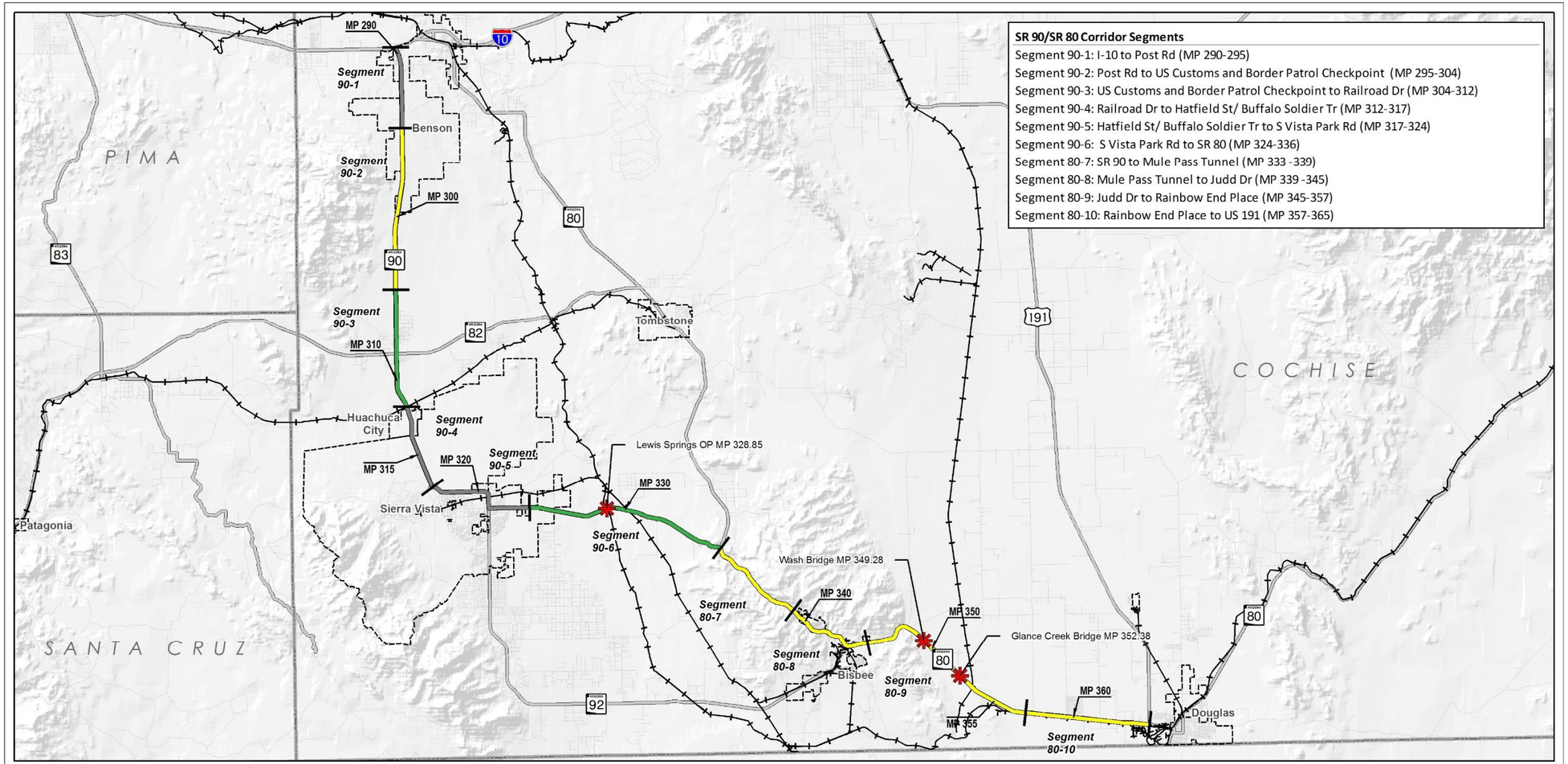
- Wash Bridge (#235), MP 349.28
- Glance Creek Bridge (#237), MP 325.38

Table 6 summarizes the Bridge performance results for the SR 90/SR 80 corridor. **Figure 10** illustrates the primary Bridge Index performance and locations of Bridge hot spots along the SR 90/SR 80 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 6: Bridge Performance

Segment #	Segment Length (miles)	# of Bridges	Bridge Index	Sufficiency Rating	% of Deck Area on Functionally Obsolete Bridges	Lowest Bridge Rating
90-1	5	0	No Bridges			
90-2	9	2	6.49	94.52	0.0%	6
90-3	8	3	6.69	94.68	0.0%	6
90-4	5	0	No Bridges			
90-5	7	0	No Bridges			
90-6	12	2	6.60	93.90	0%	5
80-7	6	3	5.85	75.83	49%	5
80-8	6	5	6.03	87.28	25%	5
80-9	12	5	5.39	68.37	0%	5
80-10	8	1	5.00	89.90	0%	5
Weighted Corridor Average			5.99	83.64	13%	5.24
SCALES						
Performance Level			**All**			
Good			> 6.5	> 80	< 12%	> 6
Fair			5.0 - 6.5	50 - 80	12% - 40%	5 - 6
Poor			< 5.0	< 50	> 40 %	< 5

Figure 10: Bridge Performance

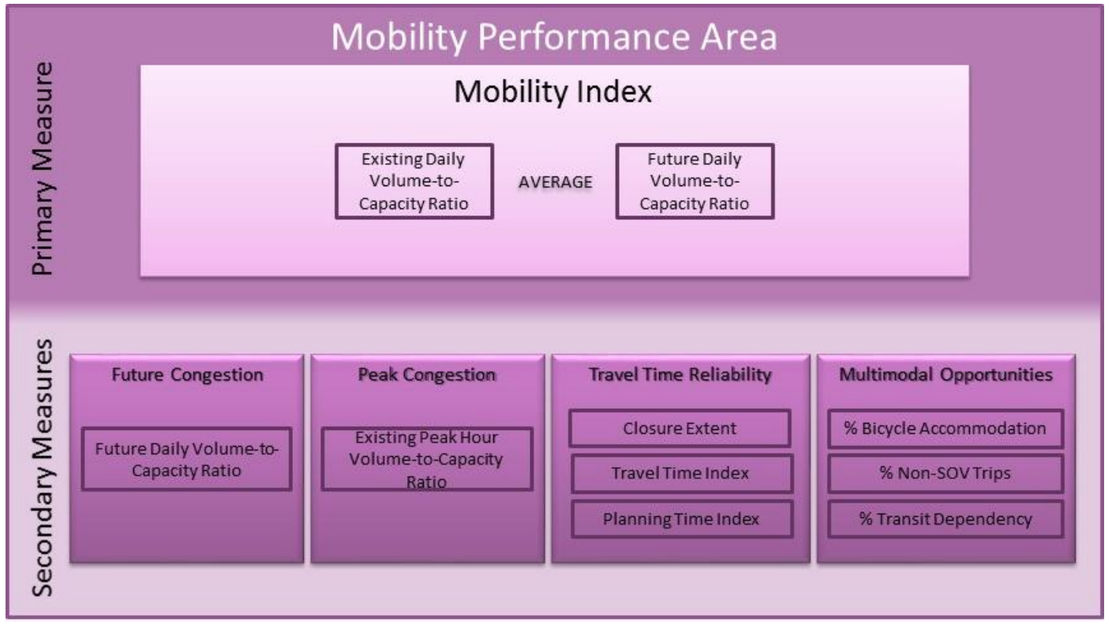


SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Bridge Index and Hot Spots
2016 Data

2.4 Mobility Performance Area

The Mobility performance area consists of a primary measure (Mobility Index) and four secondary measures, as shown in **Figure 11**. These measures assess the condition of existing mobility along the SR 90/SR 80 corridor. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 11: Mobility Performance Measures



Primary Mobility Index

The Mobility Index is an average of the existing (2014) daily volume-to-capacity (V/C) ratio and the future (2035 AZTDM) daily V/C ratio for each segment of the corridor. The V/C ratio is an indicator of the level of congestion. This measure compares the average annual daily traffic (AADT) volume to the capacity of the corridor segment as defined by the service volume for level of service (LOS) E. By using the average of the existing and future year daily volumes, this index measures the level of daily congestion projected to occur in approximately ten years (2025) if no capacity improvements are made to the corridor.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Mobility performance area, the relevant operating environments are urban vs. rural setting and interrupted flow (e.g., signalized at-grade intersections are present) vs. uninterrupted flow (e.g., controlled access grade-separated conditions such as a freeway or interstate highway). For the SR 90/SR 80 corridor, the following operating environments were identified:

- Rural Interrupted Flow: Segments 90-1, 90-2, 90-3, 90-6, and 80-10
- Rural Uninterrupted Flow: Segments 90-4, 80-7, and 80-9
- Urban Interrupted Flow: Segments 90-5 and 80-8

Secondary Mobility Measures

Four secondary measures provide an in-depth evaluation of operational characteristics of the corridor:

Future Congestion – Future Daily V/C

- The future (2035 AZTDM) daily V/C ratio; this measure is the same value used in the calculation of the Mobility Index
- Provides a measure of future congestion if no capacity improvements are made to the corridor

Peak Congestion – Existing Peak Hour V/C

- The peak hour V/C ratio for each direction of travel
- Provides a measure of existing peak hour congestion during typical weekdays

Travel Time Reliability– Three separate travel time reliability indicators together provide a comprehensive picture of how much time may be required to travel within the corridor:

- Closure Extent:
  - The average number of instances a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel; a weighted average was applied to each closure that takes into account the distance over which the closure occurs
  - Closures related to crashes, weather, or other incidents are a significant contributor to non-recurring delays; construction-related closures were excluded from the analysis
- Directional Travel Time Index (TTI):
  - The ratio of the average peak period travel time to the free-flow travel time (based on the posted speed limit) in a given direction
  - The TTI recognizes the delay potential from recurring congestion during peak periods; different thresholds are applied to uninterrupted flow (freeways) and interrupted flow (non-freeways) to account for flow characteristics
- Directional Planning Time Index (PTI):
  - The ratio of the 95th percentile travel time to the free-flow travel time (based on the posted speed limit) in a given direction

- The PTI recognizes the delay potential from non-recurring delays such as traffic crashes, weather, or other incidents; different thresholds are applied to uninterrupted flow (freeways) and interrupted flow (non-freeways) to account for flow characteristics
- The PTI indicates the amount of time in addition to the typical travel time that should be allocated to make an on-time trip 95% of the time in a given direction

Multimodal Opportunities – Three multimodal opportunity indicators reflect the characteristics of the corridor that promote alternate modes to the single occupancy vehicle (SOV) for trips along the corridor:

- % Bicycle Accommodation:
  - Percentage of the segment that accommodates bicycle travel; bicycle accommodation on the roadway or on shoulders varies depending on traffic volumes, speed limits, and surface type
  - Encouraging bicycle travel has the potential to reduce automobile travel, especially on non-interstate highways
- % Non-SOV Trips:
  - The percentage of trips (less than 50 miles in length) by non-SOVs
  - The percentage of non-SOV trips in a corridor gives an indication of travel patterns along a section of roadway that could benefit from additional multimodal options
- % Transit Dependency:
  - The percentage of households that have zero or one automobile and households where the total income level is below the federally defined poverty level
  - Used to track the level of need among those who are considered transit dependent and more likely to utilize transit if it is available

Mobility Performance Results

The Mobility Index provides a high-level assessment of mobility conditions for the corridor and for each segment. The four secondary measures provide more detailed information to assess mobility performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Mobility Index shows “good” overall performance for the SR 90/SR 80 corridor
- The Mobility Index performance shows “good” for all corridor segments
- During the existing peak hour, traffic operations are “good” for all segments
- All Segments are anticipated to have “good” performance in the future, according to the Future Daily V/C performance indicator
- The weighted average for the Closure Extent performance indicator for both NB/WB and SB/EB travel indicates “good” performance; Segment 80-7 has “poor” performance in the Closure Extent performance indicator for SB travel
- The TTI performance indicator shows that all segments on the SR 90/SR 80 corridor show “fair” or “good” performance levels
- The PTI performance indicator shows many of the SR 90/SR 80 segments, both NB/WB and SB/EB, have “fair” or “poor” performance in terms of reliability
- More than half of SR 90/SR 80 segments show “fair” performance for non-SOV trips, indicating single occupant trips are more common
- A majority of the corridor shows “fair” or “poor” performance in % Bicycle Accommodation, indicating most of the corridor has narrow shoulders

Table 7 summarizes the Mobility performance results for the SR 90/SR 80 corridor. **Figure 12** illustrates the primary Mobility Index performance along the SR 90/SR 80 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 7: Mobility Performance

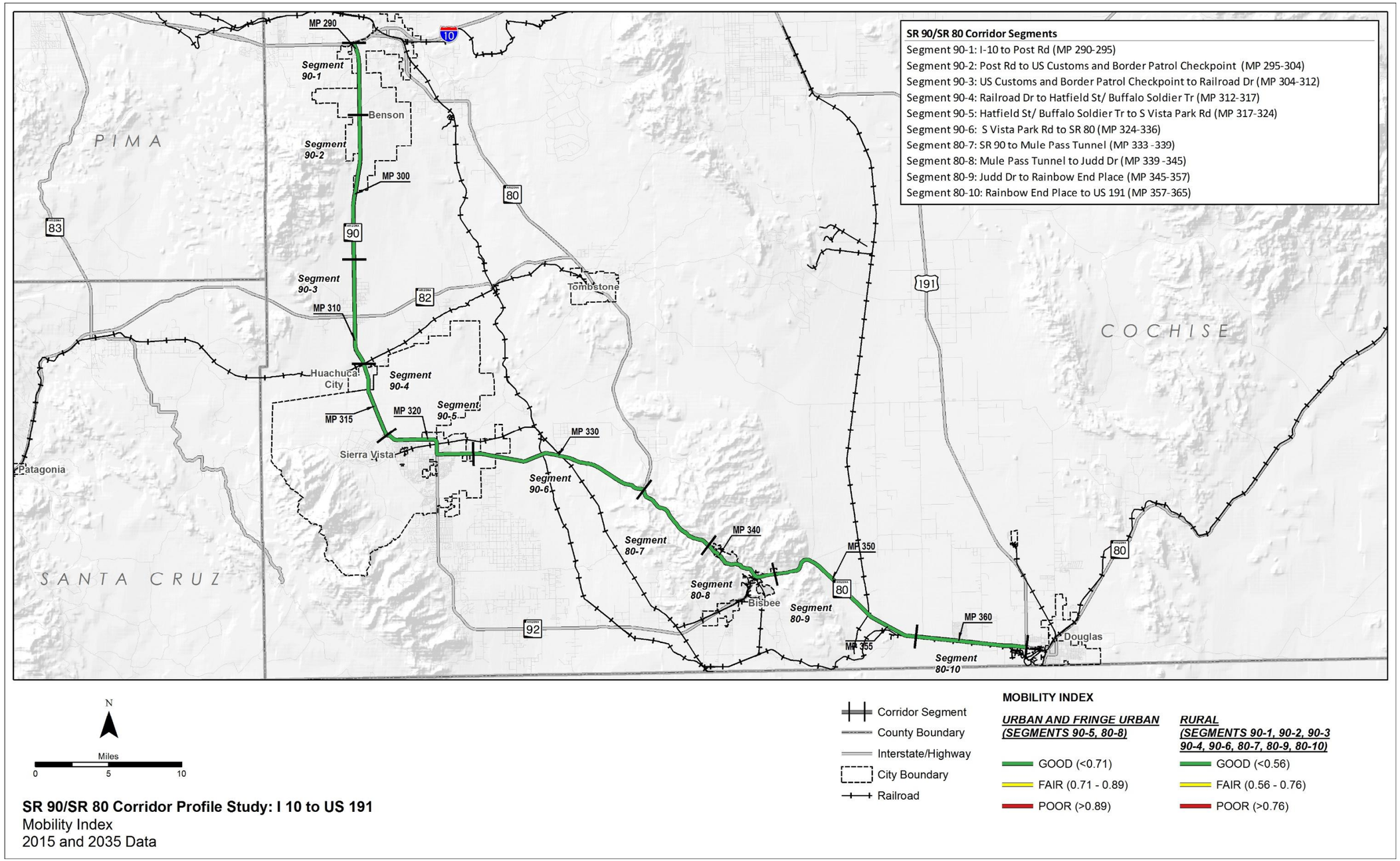
Segment #	Segment Length (miles)	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/milepost/year/mile)		Directional TTI (all vehicles)		Directional PTI (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
				NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB		
90-1[2]*	5	0.41	0.50	0.31	0.31	0.00	0.00	1.28	1.69	7.01	3.29	88%	14.1%
90-2[2]*	9	0.18	0.22	0.13	0.13	0.07	0.02	1.19	1.00	4.91	1.11	100%	14.6%
90-3[2]*	8	0.44	0.51	0.33	0.33	0.08	0.24	1.04	1.01	1.95	1.65	96%	17.2%
90-4[2]^	5	0.28	0.32	0.21	0.21	0.16	0.22	1.02	1.04	1.57	2.14	96%	17.3%
90-5[1]*	7	0.47	0.51	0.34	0.39	0.00	0.21	1.35	1.36	7.93	6.41	26%	19.2%
90-6[2]*	12	0.30	0.33	0.29	0.29	0.05	0.24	1.13	1.11	2.14	1.84	3%	15.6%
80-7[2]^	6	0.50	0.38	0.52	0.55	0.10	0.71	1.00	1.09	1.26	1.75	0%	15.3%
80-8[1]*	6	0.27	0.20	0.31	0.27	0.00	0.27	1.06	1.09	1.81	1.96	43%	16.4%
80-9[2]^	12	0.13	0.08	0.13	0.13	0.00	0.13	1.08	1.05	1.65	1.42	88%	11.4%
80-10[2]*	8	0.13	0.10	0.15	0.15	0.02	0.04	1.08	1.09	1.57	1.82	97%	14.9%
Weighted Corridor Average		0.29	0.30	0.26	0.26	0.04	0.20	1.12	1.13	3.00	2.19	62%	15.3%

SCALES

Performance Level	Urban Rural	All	Uninterrupted Interrupted		All	
Good	< 0.71[1] < 0.56[2]	< 0.22	< 1.15^ < 1.30*	< 1.30^ < 3.00*	> 90%	> 17%
Fair	0.71 - 0.89[1] 0.56 - 0.76[2]	0.22 – 0.62	1.15 - 1.33^ 1.30 - 2.00*	1.30 - 1.50^ 3.00 - 6.00*	60% - 90%	11% - 17%
Poor	> 0.89[1] > 0.76[2]	> 0.62	> 1.33^ > 2.00*	> 1.50^ > 6.00*	< 60%	< 11%

[1]Urban Operating Environment
[2]Rural Operating Environment
^Uninterrupted Flow Facility
*Interrupted Flow Facility

Figure 12: Mobility Performance

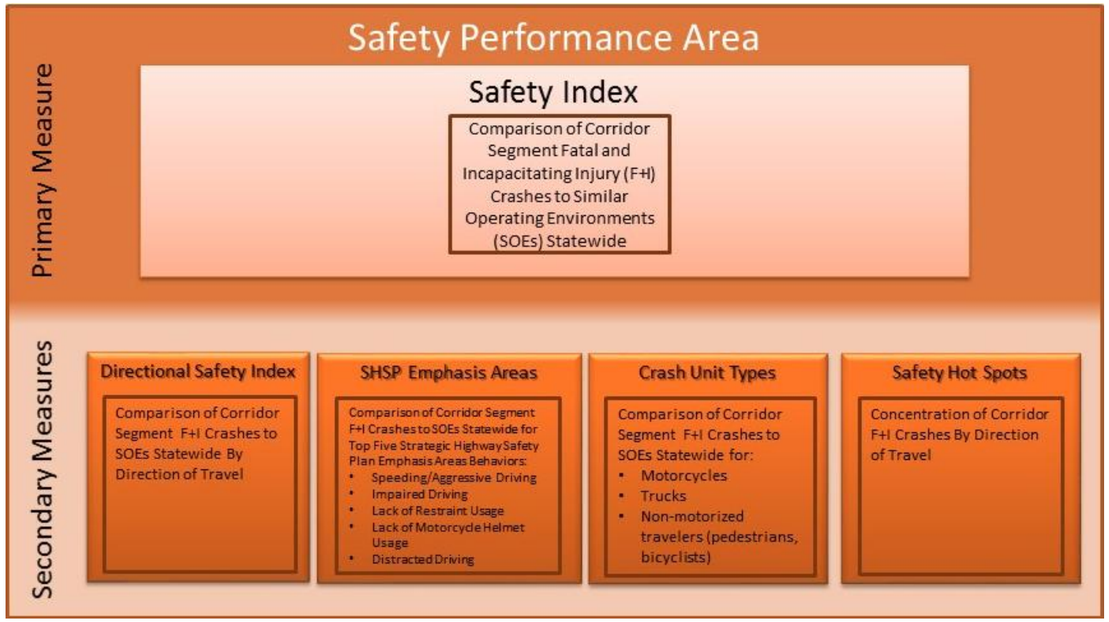


SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Mobility Index
2015 and 2035 Data

2.5 Safety Performance Area

The Safety performance area consists of a primary measure (Safety Index) and four secondary measures, as illustrated in **Figure 13**. All measures relate to crashes that result in fatal and incapacitating injuries, as these types of crashes are the emphasis of the ADOT Strategic Highway Safety Plan (SHSP), FHWA, and MAP-21. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C.**

Figure 13: Safety Performance Measures



Primary Safety Index

The Safety Index is based on the bi-directional frequency and rate of fatal and incapacitating injury crashes, the relative cost of those types of crashes, and crash occurrences on similar roadways in Arizona. According to ADOT's 2010 Highway Safety Improvement Program Manual, fatal crashes have an estimated cost that is 14.5 times the estimated cost of incapacitating injury crashes ($5.8 million compared to $400,000).

Each corridor segment is rated on a scale by comparing the segment score with the average statewide score for similar operating environments. Because crash frequencies and rates vary depending on the operating environment of a particular roadway, statewide values were developed for similar operating environments defined by functional classification, urban vs. rural setting, number of travel lanes, and traffic volumes. For the SR 90/SR 80 corridor, the following operating environments were identified:

- 2 or 3 or 4 Lane Divided Highway: Segments 90-1, 90-2, 90-3, and 80-10
- 4 or 5 Lane Undivided Highway: Segments 90-4 and 90-5
- 2 or 3 lane Undivided Highway: Segments 90-6, 80-7, 80-8, and 80-9

Secondary Safety Measures

Four secondary measures provide an in-depth evaluation of the different characteristics of safety performance:

Directional Safety Index

- This measure is based on the directional frequency and rate of fatal and incapacitating injury crashes

SHSP Emphasis Areas

ADOT's 2014 SHSP identified several emphasis areas for reducing fatal and incapacitating injury crashes. This measure compared rates of crashes in the top five SHSP emphasis areas to other corridors with a similar operating environment. The top five SHSP emphasis areas related to the following driver behaviors:

- Speeding and aggressive driving
- Impaired driving
- Lack of restraint usage
- Lack of motorcycle helmet usage
- Distracted driving

Crash Unit Types

- The percentage of total fatal and incapacitating injury crashes that involves crash unit types of motorcycles, trucks, or non-motorized travelers is compared to the statewide average on roads with similar operating environments

Safety Hot Spots

- The hot spot analysis identifies abnormally high concentrations of fatal and incapacitating injury crashes along the study corridor by direction of travel

For the Safety Index and the secondary safety measures, any segment that has too small of a sample size to generate statistically reliable performance ratings for a particular performance measure is considered to have "insufficient data" and is excluded from the safety performance evaluation for that particular performance measure.

Safety Performance Results

The Safety Index provides a high-level assessment of safety performance for the corridor and for each segment. The four secondary measures provide more detailed information to assess safety performance.

Based on the results of this analysis, the following observations were made:

- The crash unit type performance measures for crashes involving SHSP Top 5 Emphasis Areas Behaviors, Trucks, Motorcycles, and Non-Motorized Travelers had insufficient data to generate reliable performance ratings for the SR 90/SR 80 corridor
- A total of 40 fatal and incapacitating injury crashes occurred along the SR 90/SR 80 corridor in 2011-2015; of these crashes, 11 were fatal and 29 involved incapacitating injuries
- The weighted average of the Safety Index and Directional Safety Indices show "above average" performance for the SR 90/SR 80 corridor, meaning the corridor generally does perform well as it relates to safety
- The Safety Index value for Segment 90-6 is "below average", meaning this segment has more crashes than is typical statewide for a similar operating environment
- The Directional Safety Index value for Segments 90-6, 80-9 and 80-10, in only one of the directions for the corridor, is "below average"
- Safety hot spots include:
  - MP 313-315
  - MP 316-317
  - MP 319-323

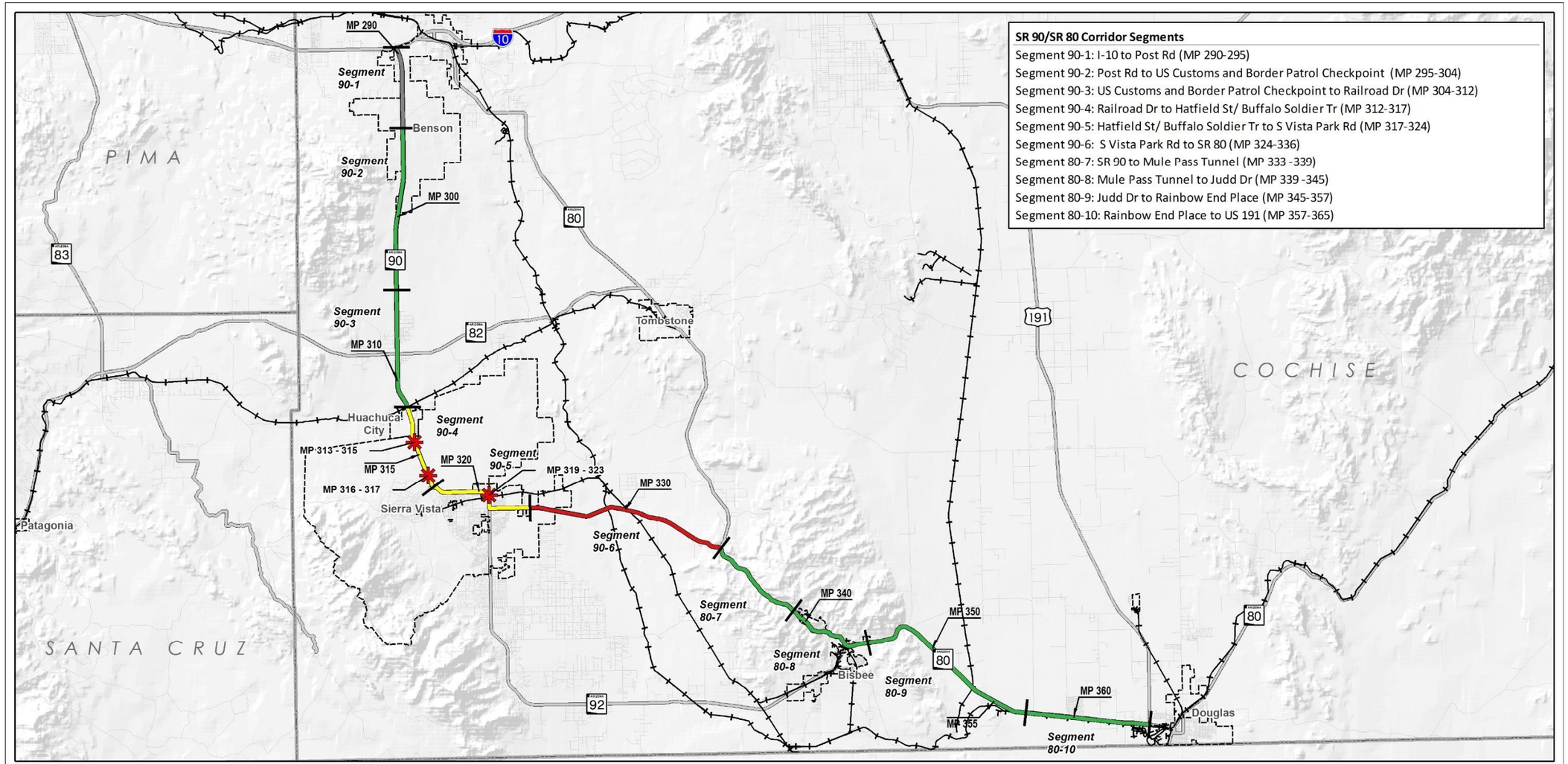
Table 8 summarizes the Safety performance results for the SR 90/SR 80 corridor. **Figure 14** illustrates the primary Safety Index performance and locations of Safety hot spots along the SR 90/SR 80 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 8: Safety Performance

Segment #	Segment Length (miles)	Total Fatal & Incapacitating Injury Crashes (F/I)	Safety Index	Directional Safety Index		% of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors	% of Fatal + Incapacitating Injury Crashes Involving Trucks	% of Fatal + Incapacitating Injury Crashes Involving Motorcycles	% of Fatal + Incapacitating Injury Crashes Involving Non-Motorized Travelers
				NB/WB	SB/EB				
90-1[a]	5	2/0	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
90-2[a]	9	0/2	0.05	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
90-3[a]	8	1/2	0.47	0.94	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
90-4[b]	5	2/4	0.88	0.93	0.82	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
90-5[b]	7	2/8	0.82	0.88	0.77	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
90-6[c]	12	2/7	1.25	2.44	0.07	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
80-7[c]	6	0/3	0.23	0.31	0.15	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
80-8[c]	6	0/0	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
80-9[c]	12	1/1	0.54	0.00	1.08	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
80-10[a]	8	1/2	0.69	0.00	1.38	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Weighted Corridor Average			0.59	0.71	0.47	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
SCALES									
Performance Level			**2 or 3 or 4 Lane Divided Highway**						
Above Average			< 0.77			< 44%	< 4%	< 16%	< 2%
Average			0.77 – 1.23			44% - 54%	4% - 7%	16% - 26%	2% - 4%
Below Average			> 1.23			> 54%	> 7%	> 26%	> 4%
Performance Level			**4 or 5 Lane Undivided Highway**						
Above Average			< 0.80			< 42%	< 6%	< 6%	< 5%
Average			0.80 – 1.20			42% - 51%	6% - 10%	6% - 9%	5% - 8%
Below Average			> 1.20			> 51%	> 10%	> 9%	> 8%
Performance Level			**2 or 3 Lane Undivided Highway**						
Above Average			< 0.94			< 51%	< 6%	< 19%	< 5%
Average			0.94 – 1.06			51% - 58%	6% - 10%	19% - 27%	5% - 8%
Below Average			> 1.06			> 58%	> 10%	> 27%	> 8%

[a]2 or 3 or 4 Lane Divided Highway
[b]4 or 5 Lane Undivided Highway
[c]2 or 3 Lane Undivided Highway
Note: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings.

Figure 14: Safety Performance



2.6 Freight Performance Area

The Freight performance area consists of a single primary measure (Freight Index) and five secondary measures, as illustrated in **Figure 15**. All measures related to the reliability of truck travel as measured by observed truck travel time speed and delays to truck travel from freeway closures or physical restrictions to truck travel. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 15: Freight Performance Measures

Primary Freight Index

The Freight Index is a reliability performance measure based on the PTI for truck travel. The Truck Planning Time Index (TPTI) is the ratio of the 95th percentile truck travel time to the free-flow truck travel time. The TPTI reflects the extra buffer time needed for on-time delivery while accounting for non-recurring delay. Non-recurring delay refers to unexpected or abnormal delay due to closures or restrictions resulting from circumstances such as crashes, inclement weather, and construction activities.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Freight performance area, the relevant operating environments are interrupted flow (e.g., signalized at-grade intersections are present) and uninterrupted flow (e.g., controlled access grade-separated conditions such as a freeway or interstate highway).

For the SR 90/SR 80 corridor, the following operating environments were identified:

- Interrupted Flow: Segments 90-1, 90-2, 90-3, 90-5, 90-6, 80-8, and 80-10
- Uninterrupted Flow: Segments 90-4, 80-7, and 80-9

Secondary Freight Measures

The Freight performance area includes five secondary measures that provide an in-depth evaluation of the different characteristics of freight performance:

Recurring Delay (Directional Truck Travel Time Index [TTTI])

- The ratio of the average peak period truck travel time to the free-flow truck travel time (based on the posted speed limit up to a maximum of 65 miles per hour) in a given direction
- The TTTI recognizes the delay potential from recurring congestion during peak periods; different thresholds are applied to uninterrupted flow (freeways) and interrupted flow (non-freeways) to account for flow characteristics

Non-Recurring Delay (Directional TPTI)

- The ratio of the 95th percentile truck travel time to the free-flow truck travel time (based on the posted speed limit up to a maximum of 65 miles per hour) in a given direction
- The TPTI recognizes the delay potential from non-recurring delays such as traffic crashes, weather, or other incidents; different thresholds are applied to uninterrupted flow (freeways) and interrupted flow (non-freeways) to account for flow characteristics
- The TPTI indicates the amount of time in addition to the typical travel time that should be allocated to make an on-time trip 95% of the time in a given direction

Closure Duration

- The average time (in minutes) a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel; a weighted average is applied to each closure that takes into account the distance over which the closure occurs

Bridge Vertical Clearance

- The minimum vertical clearance (in feet) over the travel lanes for underpass structures on each segment

Bridge Vertical Clearance Hot Spots

- A Bridge vertical clearance "hot spot" exists where the underpass vertical clearance over the mainline travel lanes is less than 16.25 feet and no exit/entrance ramps exist to allow vehicles to bypass the low clearance location
- If a location with a vertical clearance less than 16.25 feet can be avoided by using immediately adjacent exit/entrance ramps rather than the mainline, it is not considered a hot spot

Freight Performance Results

The Freight Index provides a high-level assessment of freight mobility for the corridor and for each segment. The five secondary measures provide more detailed information to assess freight performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Freight Index shows "fair" overall performance for the SR 90/SR 80 corridor
- A majority of the segments show either "good" or "fair" performance for the Directional TTTI measure
- A majority of the segments show either "poor" or "fair" performance for Directional TPTI measure, meaning the corridor has "poor" or "fair" travel time reliability in the NB/WB and SB/EB direction due to non-recurring congestion
- Segment 80-7 in the SB/EB direction shows "poor" performance in the closure duration performance measure; all other segments show "good" or "fair" performance
- Three bridge vertical clearance hot spots exist in Segment 80-8; Mule Pass Tunnel (#00538, MP 339.06), Lowell RR UP (#00269, MP 343.01), and Lowell UP RR (#01033, MP 343.01)

Table 9 summarizes the Freight performance results for the SR 90/SR 80 corridor. **Figure 16** illustrates the primary Freight Index performance and locations of freight hot spots along the SR 90/SR 80 corridor. Maps for each secondary measure can be found in **Appendix A**.

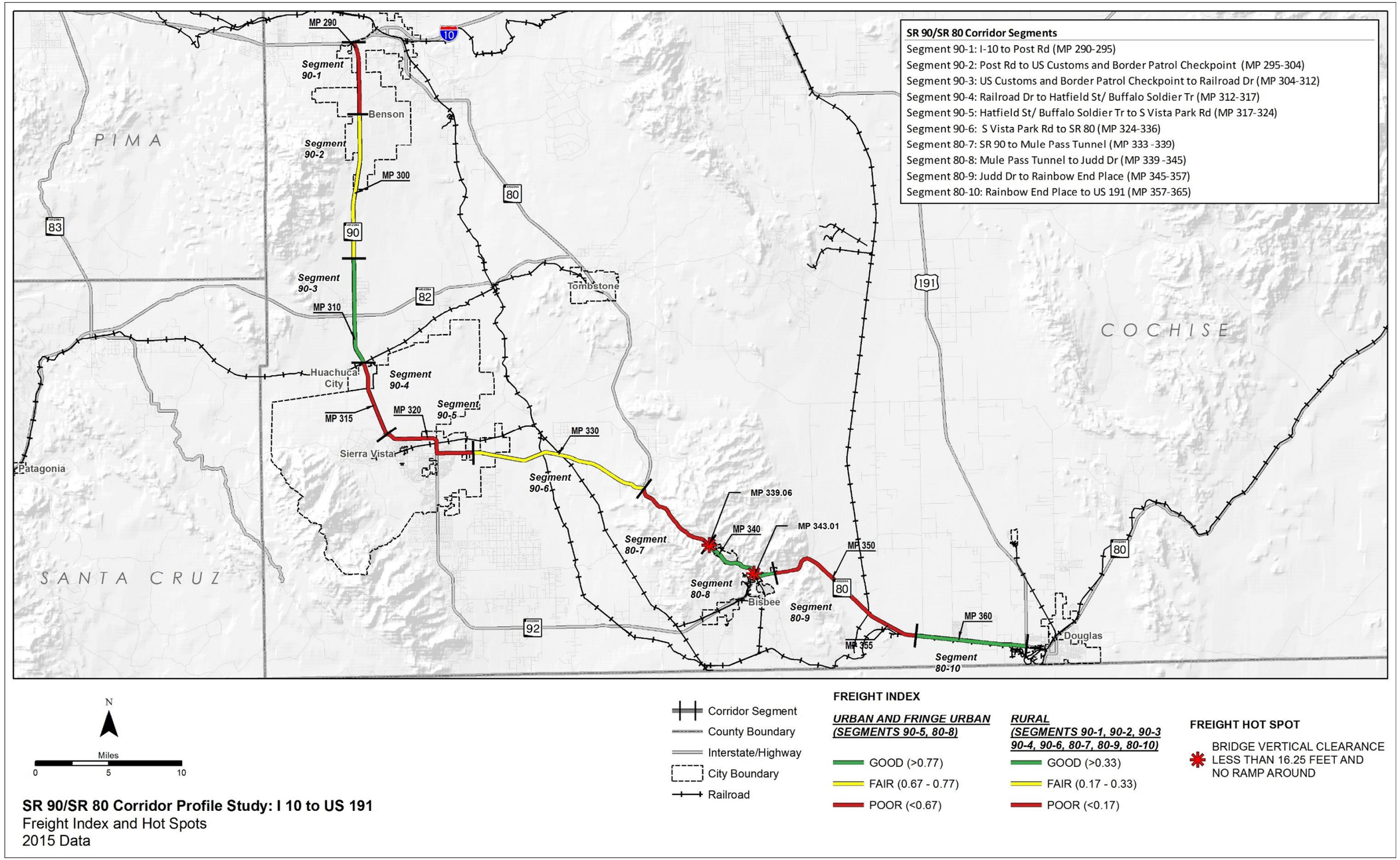
Table 9: Freight Performance

Segment #	Segment Length (miles)	Freight Index	Directional TTTI		Directional TPTI		Closure Duration (minutes/ milepost/ year/mile)		Bridge Vertical Clearance (feet)
			NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	
90-1[2]*	5	0.16	2.00	1.86	9.35	3.29	0.00	0.00	No UP
90-2[2]*	9	0.27	1.59	1.00	6.45	1.08	10.51	1.87	No UP
90-3[2]*	8	0.35	1.11	1.05	2.96	2.70	17.07	32.50	No UP
90-4[2]^	5	0.26	1.10	1.14	2.63	5.11	38.72	18.84	No UP
90-5[1]*	7	0.17	1.41	1.40	5.46	6.42	0.00	87.57	No UP
90-6[2]*	12	0.32	1.23	1.22	3.37	2.83	10.45	54.73	No UP
80-7[2]^	6	0.53	1.02	1.27	1.44	2.31	10.90	190.07	No UP
80-8[1]*	6	0.46	1.10	1.19	2.22	2.14	0.00	104.93	13.95
80-9[2]^	12	0.63	1.08	1.05	1.76	1.41	0.00	19.00	No UP
80-10[2]*	8	0.60	1.09	1.10	1.62	1.72	2.73	6.04	No UP
Weighted Corridor Average		0.39	1.26	1.20	3.56	2.70	8.36	47.21	13.95

SCALES					
Performance Level	**Uninterrupted Interrupted**			**All**	
Good	> 0.77^ > 0.33*	< 1.15^ < 1.30*	< 1.30^ < 3.00*	< 44.18	> 16.5
Fair	0.67 - 0.77^ 0.17 - 0.33*	1.15 -1.33^ 1.30 - 2.00*	1.30 - 1.50^ 3.00-6.00*	44.18 -124.86	16.0 - 16.5
Poor	< 0.67^ < 0.17*	> 1.33^ > 2.00*	> 1.50^ > 6.00*	> 124.86	< 16.0

[1]Urban Operating Environment
[2]Rural Operating Environment
^Uninterrupted Flow Facility
*Interrupted Flow Facility

Figure 16: Freight Performance



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Freight Index and Hot Spots
2015 Data

2.7 Corridor Performance Summary

Based on the results presented in the preceding sections, the following general observations were made related to the performance of the SR 90/SR 80 corridor:

- Overall Performance: The Pavement and Mobility performance areas show generally "good" performance; the Bridge and Freight performance areas show generally "fair" performance; the Safety performance area shows a mix of "good", "fair", and "poor" performance with some of the corridor having insufficient data in order to generate reliable results
- Pavement Performance: The weighted average of the Pavement Index shows "good" overall performance for the SR 90/SR 80 corridor; Segments 90-5 and 80-8 show "fair" or "poor" performance for all Pavement performance area measures; Segment 80-7 shows "poor" performance for the Pavement Index and % Area Failure measures
- Bridge Performance: The weighted average of the Bridge Index shows "fair" overall performance for the SR 90/SR 80 corridor; Segment 80-7 shows "fair" or "poor" performance for all Bridge performance area measures; the weighted average for the % of Deck Area on Functionally Obsolete Bridges and Lowest Bridge Rating measures shows "fair" performance; the weighted average for the Sufficiency Rating measure shows "good" performance; Segments 90-2, 90-4, and 90-5 contain no bridges
- Mobility Performance: The weighted average of the Mobility Index shows "good" overall performance for the SR 90/SR 80 corridor; the Future Daily V/C and Existing Peak Hour V/C measures show "good" performance for all segments along the corridor; the Closure Extent and Directional TTI measures show generally "good" performance, excluding a few segments for the SB/EB direction; Segment 90-5 shows "poor" performance in both directions for the Directional PTI measure; the weighted average for the Directional PTI measure shows "fair" in the NB/WB direction and "good" in the SB/EB direction; Segments 909-5 through 80-8 show "poor" performance for the % Bicycle Accommodation measure and the weighted average for the corridor shows "fair" performance; the % Non-SOV Trips measure shows generally "fair" performance along the corridor
- Safety Performance: The weighted average of the Safety Index and Directional Safety Indices show "above average" performance for the SR 90/SR 80 corridor; the crash unit type performance measures for crashes involving SHSP Top 5 Emphasis Areas Behaviors, Trucks, Motorcycles, and Non-Motorized Travelers had insufficient data to generate reliable performance ratings; Segment 90-6 shows "below average" performance for the Safety Index and Directional Safety Index in the NB/WB direction measures; Segments 80-9 and 80-10 show "below average" performance for the Directional Safety Index measure in the SB/EB direction; Segment 90-1 had insufficient data to generate reliable performance ratings for all Safety performance measures
- Freight Performance: The weighted average of the Freight Index shows "fair" overall performance for the SR 90/SR 80 corridor; Segments 90-1, 90-2, 90-4, 90-5, 90-6, 80-7, and 80-9 show "fair" or "poor" performance for the Freight Index and Directional TPTI measures; Segment 80-7 in the SB/EB direction shows "poor" performance in the closure duration performance measure; three bridge vertical clearance hot spots exist in Segment 80-8
- Lowest Performing Segments: Segments 90-4, 90-5, and 80-7 show "poor/below average" performance for many performance measures
- Highest Performing Segments: Segments 90-2, 90-3, 80-10 show "good/above average" performance for many performance measures

Figure 17 shows the percentage of the SR 90/SR 80 corridor that rates either "good/above average" performance, "fair/average" performance, or "poor/below average" performance for each primary measure. On the SR 90/SR 80 corridor, Bridge and Freight are the lowest performing areas with 77% and 60% of the corridor, respectively, having "fair" or "poor" performance as it relates to primary measures. Pavement and Mobility are the highest performing areas along the SR 90/SR 80 corridor with 77% and 100% of the corridor, respectively, having "good" condition as it relates to primary measures. Safety performance areas show a mx of "above average", "average", "below average", and insufficient data.

Table 10 shows a summary of corridor performance for all primary measures and secondary measure indicators for the SR 90/SR 80 corridor. A weighted corridor average rating (based on the length of the segment) was calculated for each primary and secondary measure. The weighted average ratings are summarized in **Figure 18** which also provides a brief description of each performance measure. **Figure 18** represents the average for the entire corridor and any given segment or location could have a higher or lower rating than the corridor average.

Figure 17: Performance Summary by Primary Measure

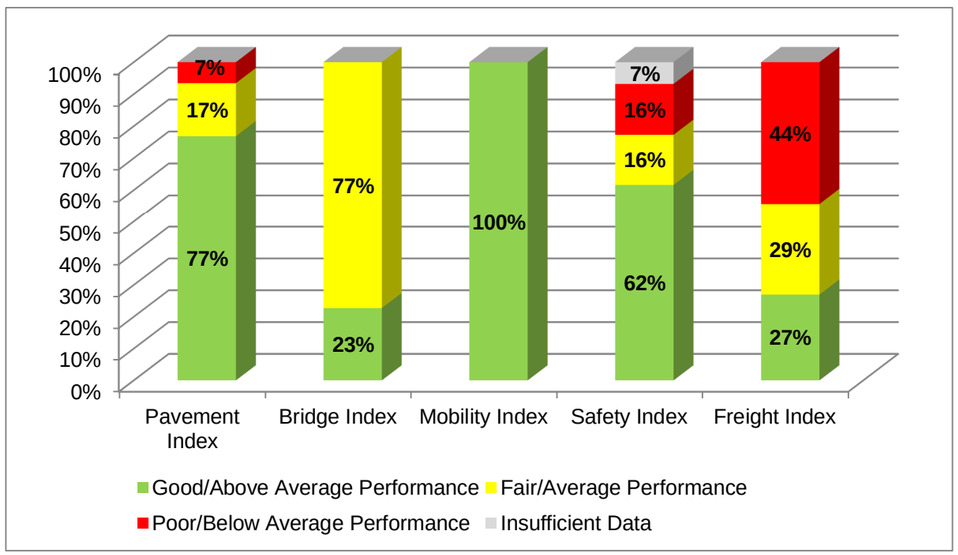


Figure 18: Corridor Performance Summary by Performance Measure

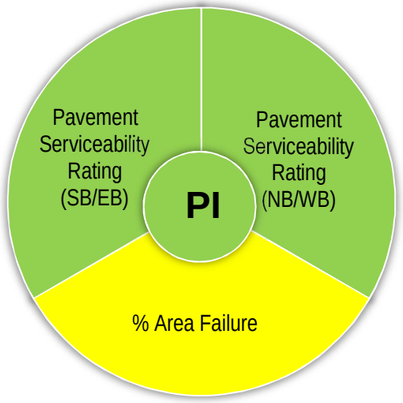
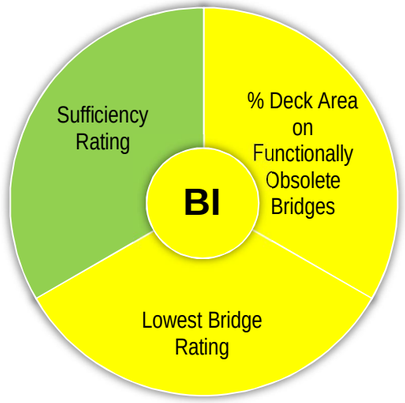
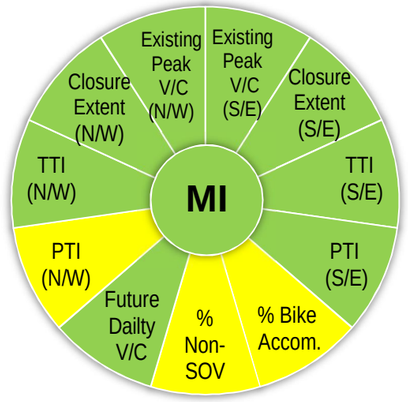
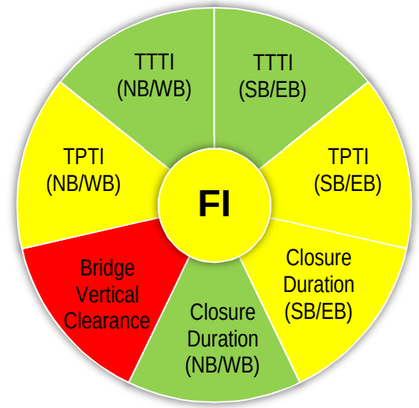
Pavement	Bridge	Mobility	Safety	Freight
				
Pavement Index (PI): based on two pavement condition ratings from the ADOT Pavement Database; the two ratings are the International Roughness Index (IRI) and the Cracking Rating	Bridge Index (BI): based on four bridge condition ratings from the ADOT Bridge Database; the four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating	Mobility Index (MI): an average of the existing daily volume-to-capacity (V/C) ratio and the projected 2035 daily V/C ratio	Safety Index (SI): combines the bi-directional frequency and rate of fatal and incapacitating injury crashes, compared to crash occurrences on similar roadways in Arizona	Freight Index (FI): a reliability performance measure based on the bi-directional planning time index for truck travel
➢ Directional Pavement Serviceability Rating (PSR) – the weighted average (based on number of lanes) of the PSR for the pavement in each direction of travel ➢ % Area Failure – the percentage of pavement area rated above failure thresholds for IRI or Cracking	➢ Sufficiency Rating– multipart rating includes structural adequacy and safety factors as well as functional aspects such as traffic volume and length of detour ➢ % of Deck Area on Functionally Obsolete Bridges– the percentage of deck area in a segment that is on functionally obsolete bridges; identifies bridges that no longer meet standards for current traffic volumes, lane width, shoulder width, or bridge rails; a bridge that is functionally obsolete may still be structurally sound ➢ Lowest Bridge Rating –the lowest rating of the four bridge condition ratings on each segment	➢ Future Daily V/C – the future 2035 V/C ratio provides a measure of future congestion if no capacity improvements are made to the corridor ➢ Existing Peak Hour V/C – the existing peak hour V/C ratio for each direction of travel provides a measure of existing peak hour congestion during typical weekdays ➢ Closure Extent – the average number of instances a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel ➢ Directional Travel Time Index (TTI) – the ratio of the average peak period travel time to the free-flow travel time; the TTI represents recurring delay along the corridor ➢ Directional Planning Time Index (PTI) – the ratio of the 95th percentile travel time to the free-flow travel time; the PTI represents non-recurring delay along the corridor ➢ % Bicycle Accommodation – the percentage of a segment that accommodates bicycle travel ➢ % Non-single Occupancy Vehicle (Non-SOV) Trips –the percentage of trips that are taken by vehicles carrying more than one occupant	➢ Directional Safety Index – the combination of the directional frequency and rate of fatal and incapacitating injury crashes, compared to crash occurrences on similar roadways in Arizona ➢ % of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors – the percentage of fatal and incapacitating crashes that involve at least one of the five Strategic Highway Safety Plan (SHSP) emphasis areas on a given segment compared to the statewide average percentage on roads with similar operating environments ➢ % of Fatal + Incapacitating Crashes Involving SHSP Crash Unit Types – the percentage of total fatal and incapacitating injury crashes that involves a given crash unit type (motorcycle, truck, non-motorized traveler) compared to the statewide average percentage on roads with similar operating environments	➢ Directional Truck Travel Time Index (TTTI) – the ratio of the average peak period truck travel time to the free-flow truck travel time; the TTTI represents recurring delay along the corridor ➢ Directional Truck Planning Time Index (TPTI) – the ratio the 95th percentile truck travel time to the free-flow truck travel time; the TPTI represents non-recurring delay along the corridor ➢ Closure Duration – the average time a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel ➢ Bridge Vertical Clearance – the minimum vertical clearance over the travel lanes for underpass structures on each segment

Table 10: Corridor Performance Summary by Segment and Performance Measure

Segment #	Segment Length (miles)	Pavement Performance Area				Bridge Performance Area				Mobility Performance Area											
		Pavement Index	Directional PSR		% Area Failure	Bridge Index	Sufficiency Rating	% of Deck Area on Functionally Obsolete Bridges	Lowest Bridge Rating	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/ year/mile)		Directional TTI (all vehicles)		Directional PTI (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
			SB/EB	NB/WB								NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB		
90-1[2*a]	5	4.10	4.16	4.17	0%	No Bridges				0.41	0.50	0.31	0.31	0.00	0.00	1.28	1.69	7.01	3.29	88%	14.1%
90-2[2*a]	9	4.30	4.33	4.14	0%	6.49	94.52	0%	6	0.18	0.22	0.13	0.13	0.07	0.02	1.19	1.00	4.91	1.11	100%	14.6%
90-3[2*a]	8	3.72	3.59	3.39	6%	6.69	94.68	0%	6	0.44	0.51	0.33	0.33	0.08	0.24	1.04	1.01	1.95	1.65	96%	17.2%
90-4[2^b]	5	3.56	3.28		20%	No Bridges				0.28	0.32	0.21	0.21	0.16	0.22	1.02	1.04	1.57	2.14	96%	17.3%
90-5[1*b]	7	3.14	3.11		29%	No Bridges				0.47	0.51	0.34	0.39	0.00	0.21	1.35	1.36	7.93	6.41	26%	19.2%
90-6[2*c]	12	3.74	3.55		0%	6.60	93.90	0%	5	0.30	0.33	0.29	0.29	0.05	0.24	1.13	1.11	2.14	1.84	3%	15.6%
80-7[2^c]	6	2.31	4.24		67%	5.85	75.83	49%	5	0.50	0.38	0.52	0.55	0.10	0.71	1.00	1.09	1.26	1.75	0%	15.3%
80-8[1*c]	6	3.35	3.10		17%	6.03	87.28	25%	5	0.27	0.20	0.31	0.27	0.00	0.27	1.06	1.09	1.81	1.96	43%	16.4%
80-9[2^c]	12	3.98	3.82		0%	5.39	68.37	0%	5	0.13	0.08	0.13	0.13	0.00	0.13	1.08	1.05	1.65	1.42	88%	11.4%
80-10[2*a]	8	3.76	3.64	3.69	6%	5.00	89.90	0%	5	0.13	0.10	0.15	0.15	0.02	0.04	1.08	1.09	1.57	1.82	97%	14.9%
Weighted Corridor Average		3.66	3.70	3.66	11%	5.99	83.64	13%	5.24	0.29	0.30	0.26	0.26	0.04	0.20	1.12	1.13	3.00	2.19	62%	15.3%

SCALES

Performance Level	**Non-Interstate**		**All**				**Urban and Fringe Urban**	**All**	**Uninterrupted**		**All**	
Good/Above Average	> 3.50	< 5%	> 6.5	> 80	< 12%	> 6	< 0.71	< 0.22	< 1.15	< 1.3	> 90%	> 17%
Fair/Average	2.90 - 3.50	5% - 20%	5.0 - 6.5	50 - 80	12% - 40%	5 - 6	0.71 - 0.89	0.22 - 0.62	1.15 - 1.33	1.3 - 1.5	60% - 90%	11% - 17%
Poor/Below Average	< 2.90	> 20%	< 5.0	< 50	> 40%	< 5	> 0.89	> .62	> 1.33	> 1.5	< 60%	< 11%

Performance Level	**Rural**	**Interrupted**	
Good/Above Average	< 0.56	< 1.3	< 3.0
Fair/Average	0.56 - 0.76	1.3 – 2.0	3.0 – 6.0
Poor/Below Average	> 0.76	> 2.0	> 6.0

^Uninterrupted Flow Facility
*Interrupted Flow Facility
[a]2 or 3 or 4 Lane Divided Highway
[b]4 or 5 Lane Undivided Highway
[c]2 or 3 Lane Undivided Highway
[1]Urban Operating Environment
[2]Rural Operating Environment

Table 10: Corridor Performance Summary by Segment and Performance Measure (continued)

Segment #	Segment Length (miles)	Safety Performance Area							Freight Performance Area							
		Safety Index	Directional Safety Index		% of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors	% of Fatal + Incapacitating Injury Crashes Involving Trucks	% of Fatal + Incapacitating Injury Crashes Involving Motorcycles	% of Fatal + Incapacitating Injury Crashes Involving Non-Motorized Travelers	Freight Index	Directional TTTI		Directional TPTI		Closure Duration (minutes/milepost/year/mile)		Bridge Vertical Clearance (feet)
			NB/WB	SB/EB						NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	
90-1[2*a]	5	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.16	2.00	1.86	9.35	3.29	0.00	0.00	No UP
90-2[2*a]	9	0.05	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.27	1.59	1.00	6.45	1.08	10.51	1.87	No UP
90-3[2*a]	8	0.47	0.94	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.35	1.11	1.05	2.96	2.70	17.07	32.50	No UP
90-4[2^b]	5	0.88	0.93	0.82	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.26	1.10	1.14	2.63	5.11	38.72	18.84	No UP
90-5[1*b]	7	0.82	0.88	0.77	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.17	1.41	1.40	5.46	6.42	0.00	87.57	No UP
90-6[2*c]	12	1.25	2.44	0.07	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.32	1.23	1.22	3.37	2.83	10.45	54.73	No UP
80-7[2^c]	6	0.23	0.31	0.15	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.53	1.02	1.27	1.44	2.31	10.90	190.07	No UP
80-8[1*c]	6	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.46	1.10	1.19	2.22	2.14	0.00	104.93	13.95
80-9[2^c]	12	0.54	0.00	1.08	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.63	1.08	1.05	1.76	1.41	0.00	19.00	No UP
80-10[2*a]	8	0.69	0.00	1.38	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.60	1.09	1.10	1.62	1.72	2.73	6.04	No UP
Weighted Corridor Average		0.59	0.70	0.47	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.39	1.26	1.20	3.56	2.70	8.36	47.21	13.95

SCALES

Performance Level	**2 or 3 or 4 Lane Divided Highway**					**Uninterrupted**			**All**	
Good/Above Average	< 0.77	< 44%	< 4%	< 16%	< 2%	> 0.77	< 1.15	< 1.3	< 44.18	> 16.5
Fair/Average	0.77 - 1.23	44% - 54%	4% - 7%	16% - 26%	2% - 4%	0.67 - 0.77	1.15 - 1.33	1.3 - 1.5	44.18-124.86	16.0 - 16.5
Poor/Below Average	> 1.23	> 54%	> 7%	> 26%	> 4%	< 0.67	> 1.33	> 1.5	> 124.86	< 16.0
Performance Level	**2 or 3 Lane Undivided Highway**					**Interrupted**				
Good/Above Average	< 0.94	< 51%	< 6%	< 19%	< 5%	> 0.33	< 1.3	< 3.0		
Fair/Average	0.94 - 1.06	51% - 58%	6% - 10%	19% - 27%	5% - 8%	0.17 - 0.33	1.3 - 2.0	3.0 - 6.0		
Poor/Below Average	> 1.06	> 58%	> 10%	> 27%	> 8%	< 0.17	> 2.0	> 6.0		
Performance Level	**4 or 5 Undivided Highway**									
Good/Above Average	< 0.80	< 42%	< 6%	< 6%	< 5%					
Fair/Average	0.80 - 1.20	42% - 51%	6% - 10%	6% - 9%	5% - 8%					
Poor/Below Average	> 1.20	> 51%	> 10%	> 9%	> 8%					

^Uninterrupted Flow Facility
*Interrupted Flow Facility
[a]2 or 3 or 4 Lane Divided Highway
[b]4 or 5 Lane Undivided Highway
[c]2 or 3 Lane Undivided Highway
[1]Urban Operating Environment
[2]Rural Operating Environment

Notes: *"Insufficient Data" indicates there was not enough data available to generate reliable performance ratings*
"No UP" indicates no underpasses are present in the segment

3.0 NEEDS ASSESSMENT

3.1 Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP), 2010-2035. Statewide performance goals that are relevant to SR 90/SR 80 performance areas were identified and corridor goals were then formulated for each of the five performance areas that aligned with the overall statewide goals established by the LRTP. Based on stakeholder input, corridor goals, corridor objectives, and performance results, three "emphasis areas" were identified for the SR 90/SR 80 corridor: Pavement, Safety, and Freight.

Taking into account the corridor goals and identified emphasis areas, performance objectives were developed for each quantifiable performance measure that identify the desired level of performance based on the performance scale levels for the overall corridor and for each segment of the corridor. For the performance emphasis areas, the corridor-wide weighted average performance objectives are identified with a higher standard than for the other performance areas. **Table 11** shows the SR 90/SR 80 corridor goals, corridor objectives, and performance objectives, and how they align with the statewide goals.

It is not reasonable within a financially constrained environment to expect that every performance measure will always be at the highest levels on every corridor segment. Therefore, individual corridor segment objectives have been set as "fair/average" or better and should not fall below that standard.

Achieving corridor and segment performance objectives will help ensure that investments are targeted toward improvements that support the safe and efficient movement of travelers on the corridor. Addressing current and future congestion, thereby improving mobility on congested segments, will also help the corridor fulfill its potential as a significant contributor to the region's economy.

Corridor performance is measured against corridor and segment objectives to determine needs – the gap between observed performance and performance objectives.

Goal achievement will improve or reduce current and future congestion, increase travel time reliability, and reduce fatalities and incapacitating injuries resulting from vehicle crashes. Where performance is currently rated "good", the goal is always to maintain that standard, regardless of whether or not the performance is in an emphasis area.

Table 11: Corridor Performance Goals and Objectives

ADOT Statewide LRTP Goals	SR 90/SR 80 Corridor Goals	SR 90/SR 80 Corridor Objectives	Performance Area	Primary Measure	Performance Objective	
				Secondary Measure Indicators	Corridor Average	Segment
Improve Mobility, Reliability, and Accessibility	Improve mobility through additional capacity and improved roadway geometry Provide a safe and reliable route for recreational and tourist travel Provide safe, reliable and efficient connection to all communities along the corridor to permit efficient regional travel Implement critical/cost-effective investments to improve access to multimodal transportation	Reduce current congestion and plan to facilitate future congestion that accounts for anticipated growth Reduce delays from recurring and non-recurring events to improve reliability Emphasize the deployment of technology to optimize existing system capacity and performance Support and facilitate better accessibility to the statewide multimodal transportation system	Mobility	Mobility Index	Fair or better	Fair or better
				Future Daily V/C		
				Existing Peak Hour V/C		
				Closure Extent		
				Directional Travel Time Index		
				Directional Planning Time Index		
				% Bicycle Accommodation		
				% Non-SOV Trips		
Make Cost-Effective Investment Decisions and Support Economic Vitality	Provide a safe, reliable, and efficient freight route	Implement the most cost-effective transportation solutions Reduce delays and restrictions to freight movement to improve reliability Improve travel time reliability (including impacts to motorists due to freight traffic)	Freight *(Emphasis Area)*	Freight Index	Good	Fair or better
				Directional Truck Travel Time Index		
				Directional Truck Planning Time Index		
				Closure Duration		
				Bridge Vertical Clearance		
Preserve and Maintain the State Transportation System	Maintain, preserve, extend the service life, and modernize State Transportation System infrastructure	Maintain structural integrity of bridges	Bridge	Bridge Index	Fair or better	Fair or better
				Sufficiency Rating		
				% of Deck Area on Functionally Obsolete Bridges		
				Lowest Bridge Rating		
		Improve pavement ride quality for all corridor users Reduce long-term pavement maintenance costs	Pavement (*Emphasis Area*)	Pavement Index	Good	Fair or better
				Directional Pavement Serviceability Rating		
				% Area Failure		
Enhance Safety and Security	Provide a safe, reliable, and efficient connection for the communities along the corridor Improve transportation system safety for all modes	Reduce the number and rate of fatal and incapacitating injury crashes for all roadway users	Safety *(Emphasis Area)*	Safety Index	Above Average	Average or better
				Directional Safety Index		
				% of Crashes Involving SHSP Top 5 Emphasis Areas Behaviors		
				% of Crashes Involving Crash Unit Types		

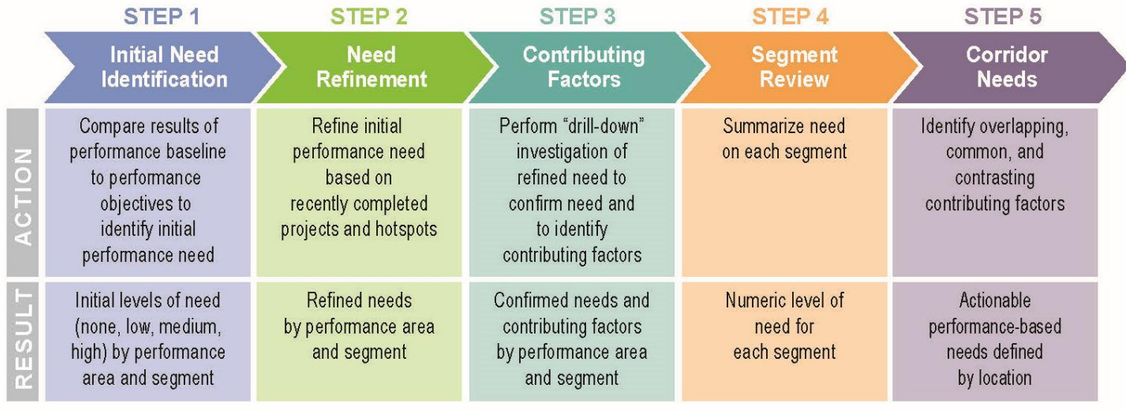
3.2 Needs Assessment Process

The following guiding principles were used as an initial step in developing a framework for the performance-based needs assessment process:

- Corridor needs are defined as the difference between the corridor performance and the performance objectives
- The needs assessment process should be systematic, progressive, and repeatable, but also allow for engineering judgment where needed
- The process should consider all primary and secondary performance measures developed for the study
- The process should develop multiple need levels including programmatic needs for the entire length of the corridor, performance area-specific needs, segment-specific needs, and location-specific needs (defined by MP limits)
- The process should produce actionable needs that can be addressed through strategic investments in corridor preservation, modernization, and expansion

The performance-based needs assessment process is illustrated in **Figure 19** and described in the following sections.

Figure 19: Needs Assessment Process



Step 1: Initial Needs Identification

The first step in the needs assessment process links baseline (existing) corridor performance with performance objectives. In this step, the baseline corridor performance is compared to the performance objectives to provide a starting point for the identification of performance needs. This mathematical comparison results in an initial need rating of None, Low, Medium, or High for each primary and secondary performance measure. An illustrative example of this process is shown below in **Figure 20**.

Figure 20: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

Performance Thresholds	Performance Level	Initial Level of Need	Description
6.5	Good	None*	All levels of Good and top 1/3 of Fair (>6.0)
	Good		
	Good		
	Fair		
	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
5.0	Fair	Medium	Lower 1/3 of Fair and top 1/3 of Poor (4.5-5.5)
	Poor		
	Poor	High	Lower 2/3 of Poor (<4.5)
	Poor		

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

The initial level of need for each segment is refined to account for hot spots and recently completed or under construction projects, resulting in a final level of need for each segment. The final levels of need for each primary and secondary performance measure are combined to produce a weighted final need rating for each segment. Values of 0, 1, 2, and 3 are assigned to the initial need levels of None, Low, Medium, and High, respectively. A weight of 1.0 is applied to the Performance Index need and equal weights of 0.20 are applied to each need for each secondary performance measure. For directional secondary performance measures, each direction of travel receives a weight of 0.10.

Step 2: Need Refinement

In Step 2, the initial level of need for each segment is refined using the following information and engineering judgment:

- For segments with an initial need of None that contain hot spots, the level of need should be increased from None to Low
- For segments with an initial level of need where recently completed projects or projects under construction are anticipated to partially or fully address the identified need, the level of need should be reduced or eliminated as appropriate
- Programmed projects that are expected to partially or fully address an identified need are not justification to lower the initial need because the programmed projects may not be

implemented as planned; in addition, further investigations may suggest that changes in the scope of a programmed project may be warranted

The resulting final needs are carried forward for further evaluation in Step 3.

Step 3: Contributing Factors

In Step 3, a more detailed review of the condition and performance data available from ADOT is conducted to identify contributing factors to the need. Typically, the same databases used to develop the baseline performance serve as the principal sources for the more detailed analysis. However, other supplemental databases may also be useful sources of information. The databases used for diagnostic analysis are listed below:

Pavement Performance Area

- Pavement Rating Database

Bridge Performance Area

- ABISS

Mobility Performance Area

- Highway Performance Monitoring System (HPMS) Database
- AZTDM
- Real-time traffic conditions data produced by American Digital Cartography Inc. (HERE) Database
- Highway Conditions Reporting System (HCRS) Database

Safety Performance Area

- Crash Database

Freight Performance Area

- HERE Database
- HCRS Database

In addition, other sources considered helpful in identifying contributing factors are:

- Maintenance history (from ADOT PeCoS database for pavement), the level of past investments, or trends in historical data that provide context for pavement and bridge history
- Field observations from ADOT district personnel can be used to provide additional information regarding a need that has been identified
- Previous studies can provide additional information regarding a need that has been identified

Step 3 results in the identification of performance-based needs and contributing factors by segment (and MP locations, if appropriate) that can be addressed through investments in preservation, modernization, and expansion projects to improve corridor performance. See **Appendix D** for more information.

Step 4: Segment Review

In this step, the needs identified in Step 2 and refined in Step 3 are quantified for each segment to numerically estimate the level of need for each segment. Values of 0 to 3 are assigned to the final need levels (from Step 3) of None, Low, Medium, and High, respectively. A weighting factor is applied to the performance areas identified as emphasis areas and a weighted average need is calculated for each segment. The resulting average need score can be used to compare levels of need between segments within a corridor and between segments in different corridors.

Step 5: Corridor Needs

In this step, the needs and contributing factors for each performance area are reviewed on a segment-by-segment basis to identify actionable needs and to facilitate the formation of solution sets that address multiple performance areas and contributing factors. The intent of this process is to identify overlapping, common, and contrasting needs to help develop strategic solutions. This step results in the identification of corridor needs by specific location.

3.3 Corridor Needs Assessment

This section documents the results of the needs assessment process described in the prior section. The needs in each performance area were classified as either None, Low, Medium, or High based on how well each segment performed in the existing performance analysis. The needs for each segment were numerically combined to estimate the average level of need for each segment of the corridor

The final needs assessments for each performance measure, along with the scales used in analysis, are shown in **Table 12** through **Table 16**.

Pavement Needs Refinement and Contributing Factors

- The level of need in Segments 90-3 and 80-10 were increased from None to Low due to the presence of a hot spot
- The level of need in Segment 80-7 was reduced from High to None due to the recently completed project covering the segment boundaries
- There are no segments along the corridor with potential pavement repetitive historical investment issues
- See **Appendix D** for detailed information on contributing factors

Table 12: Final Pavement Needs

Segment #	Performance Score and Level of Need				Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Pavement Index	Directional PSR		% Area Failure				
		NB/WB	SB/EB					
90-1	4.10	4.16	4.17	0%	0.00	None	None	None
90-2	4.30	4.33	4.14	0%	0.00	None	None	None
90-3	3.72	3.59	3.39	6%	0.00	SB/EB MP 311-312	None	Low
90-4	3.56	3.28	3.28	20%	0.60	MP 312-313	None	Low
90-5	3.14	3.11	3.11	29%	1.80	MP 317-318; MP 321-322	None	Medium
90-6	3.74	3.55	3.55	0%	0.00	None	None	None
80-7	2.31	4.24	4.24	67%	3.60	MP 333-335; MP 336-338	Pavement rehab RR 3" & AR-ACFC, 2015 (MP 333-339)	None
80-8	3.35	3.10	3.10	17%	0.60	MP 343-344	None	Low
80-9	3.98	3.82	3.82	0%	0.00	None	None	None
80-10	3.76	3.64	3.69	6%	0.00	NB/WB MP 364-365	None	Low

Level of Need (Score)	Performance Score Need Scale		Segment Level Need Scale
None* (0)	> 3.30	< 10%	0
Low (1)	3.10 - 3.30	10% - 15%	< 1.5
Medium (2)	2.70 - 3.10	15% - 25%	1.5 - 2.5
High (3)	< 2.70	> 25%	> 2. 5

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Bridge Needs Refinement and Contributing Factors

- No changes were made to the level of need to account for hot spots or recently completed projects
- Three bridges are hot spots along the corridor:
  - Lewis Springs OP (#470, MP 328.85) in Segment 90-6 is a bridge hot spot due to deck and substructure ratings of 5 but it does not have potential repetitive historical investment issues
  - Wash Bridge (#235, MP 349.28) in Segment 80-9 is a bridge hot spot due to deck and substructure ratings of 5 but it does not have potential repetitive historical investment issues
  - Glance Creek Bridge (#237, MP 352.38) in Segment 80-9 is a bridge hot spot due to deck, substructure, and superstructure ratings of 5 but it does not have potential repetitive historical investment issues; bridge rehabilitation is programmed for FY 18
- Tombstone Canyon Br 1 (#480, MP 333.27 in Segment 80-7) and Brewery Gulch TI OP (#670, MP 341.42 in Segment 80-8) are considered functionally obsolete bridges
- There are no bridges along the corridor with potential historical investment issues
- See **Appendix D** for detailed information on contributing factors

Table 13: Final Bridge Needs

Segment #	Performance Score and Level of Need				Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Bridge Index	Sufficiency Rating	% of Deck on Functionally Obsolete Bridges	Lowest Bridge Rating				
90-1	No Bridges				0.0	None	None	None
90-2	6.49	94.52	0.00%	6.00	0.0	None	None	None
90-3	6.69	94.68	0.00%	6.00	0.0	None	None	None
90-4	No Bridges				0.0	None	None	None
90-5	No Bridges				0.0	None	None	None
90-6	6.60	93.90	0.00%	5.00	0.2	Lewis Springs OP (#470, MP 328.85)	None	Low
80-7	5.85	75.83	48.52%	5.00	1.4	None	None	Low
80-8	6.03	87.28	24.83%	5.00	0.3	None	None	Low
80-9	5.39	68.37	0.00%	5.00	2.4	Wash Bridge (#235, MP 349.28) Glance Creek Bridge (#237, MP 352.38)	None	Medium
80-10	5.00	89.90	0.00%	5.00	2.2	None	None	Medium

Level of Need (Score)	Performance Score Need Scale				Segment Level Need Scale
None (0)	> 6.0	> 70	> 5.0	< 21.0%	0
Low (1)	5.5 - 6.0	60 - 70	5.0	21.0% - 31.0%	< 1.5
Medium (2)	4.5 - 5.5	40 - 60	4.0	31.0% - 49.0%	1.5 - 2.5
High (3)	< 4.5	< 40	< 4.0	> 49.0%	> 2.5

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Mobility Needs Refinement and Contributing Factors

- There are no recently completed projects along the corridor so no changes were made to the level of need for any segment
- See **Appendix D** for detailed information on contributing factors

Table 14: Final Mobility Needs

Segment	Performance Score and Level of Need											Initial Segment Need	Recently Completed Projects	Final Segment Need
	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent		Directional TTI		Directional PTI		% Bicycle Accommodation			
			NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB				
90-1[b]	0.41	0.50	0.31	0.31	0.00	0.00	1.28	1.69	7.01	3.29	88%	0.4	None	Low
90-2[b]	0.18	0.22	0.13	0.13	0.07	0.02	1.19	1.00	4.91	1.11	100%	0.1	None	Low
90-3[b]	0.44	0.51	0.33	0.33	0.08	0.24	1.04	1.01	1.95	1.65	96%	0.0	None	None
90-4[a]	0.28	0.32	0.21	0.21	0.16	0.22	1.02	1.04	1.57	2.14	96%	0.5	None	Low
90-5[b]	0.47	0.51	0.34	0.39	0.00	0.21	1.35	1.36	7.93	6.41	26%	1.1	None	Low
90-6[b]	0.30	0.33	0.29	0.29	0.05	0.24	1.13	1.11	2.14	1.84	3%	0.6	None	Low
80-7[a]	0.50	0.38	0.52	0.55	0.10	0.71	1.00	1.09	1.26	1.75	0%	1.1	None	Low
80-8[b]	0.27	0.20	0.31	0.27	0.00	0.27	1.06	1.09	1.81	1.96	43%	0.6	None	Low
80-9[a]	0.13	0.08	0.13	0.13	0.00	0.13	1.08	1.05	1.65	1.42	88%	0.4	None	Low
80-10[b]	0.13	0.10	0.15	0.15	0.02	0.04	1.08	1.09	1.57	1.82	97%	0.0	None	None

Level of Need (Score)	Performance Score Need Scale					Segment Level Need Scale
None* (0)	≤ 0.77 (Urban) ≤ 0.63 (Rural)	< 0.35	< 1.21[a] < 1.53[b]	< 1.37[a] < 4.00[b]	> 80%	0
Low (1)	0.77 - 0.83 (Urban) 0.63 - 0.69 (Rural)	0.35 - 0.49	1.21 - 1.27[a] 1.53 - 1.77[b]	1.37 - 1.43[a] 4.00 - 5.00[b]	70% - 80%	< 1.5
Medium (2)	0.83 - 0.95 (Urban) 0.69 - 0.83 (Rural)	0.49 - 0.75	1.27 - 1.39[a] 1.77 - 2.23[b]	1.43 - 1.57[a] 5.00 - 7.00[b]	50% - 70%	1.5 - 2.5
High (3)	≥ 0.95 (Urban) ≥ 0.83 (Rural)	> 0.75	> 1.39[a] > 2.23[b]	> 1.57[a] > 7.00[b]	< 50%	> 2.5

a: Uninterrupted Flow
b: Interrupted Flow

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Safety Needs Refinements and Contributing Factors

- The level of need in Segment 90-5 was increased from None to Low due to the presence of a hot spot
- Segment 90-1 had insufficient data in order to generate reliable performance scores
- There are a few recently completed projects along the corridor but they did not substantially affect the overall segment performance so no changes were made to the level of need
- See **Appendix D** for detailed information on contributing factors

Table 15: Final Safety Needs

Segment	Performance Score and Level of Need							Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Safety Index	Directional Safety Index		% of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Area Behaviors	% of Fatal + Incapacitating Injury Crashes Involving Trucks	% of Fatal + Incapacitating Injury Crashes Involving Motorcycles	% of Fatal + Incapacitating Injury Crashes Involving Non-Motorized Travelers				
		NB/WB	SB/EB								
90-1[a]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	N/A	N/A	N/A	N/A
90-2[a]	0.05	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
90-3[a]	0.47	0.94	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.1	None	None	Low
90-4[b]	0.88	0.93	0.82	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.1	MP 313-315; MP 316-317	Construct Pedestrian Walkway - Town of Huachuca City (2015)	Low
90-5[b]	0.82	0.88	0.77	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	MP 319-323	Construct lighting and multi-use path (MP 321.2-322.5), 2014	Low
90-6	1.25	2.44	0.07	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	3.3	None	None	High
80-7	0.23	0.31	0.15	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	Pavement rehab RR 3" & AR-ACFC, 2015 (MP 333-339)	None
80-8	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
80-9	0.54	0.00	1.08	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.2	None	None	Low
80-10	0.69	0.00	1.38	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.2	None	None	Low

Level of Need (Score)		Performance Score Needs Scale					Segment Level Need Scale
None* (0)	a b c	≤ 0.92 ≤ 0.93 ≤ 0.98	≤ 47% ≤ 45% ≤ 53%	≤ 5% ≤ 7% ≤ 6%	≤ 19% ≤ 7% ≤ 22%	≤ 3% ≤ 6% ≤ 3%	0
Low (1)	a b c	0.92 - 1.07 0.93 - 1.06 0.98 - 1.02	47% - 50% 45% - 48% 53% - 55%	5% - 6% 7% - 8% 6% - 7%	19% - 22% 7% - 8% 22% - 25%	3% - 4% 6% - 7% 3% - 4%	≤ 1.5
Medium (2)	a b c	1.07 - 1.38 1.06 - 1.33 1.02 - 1.10	50% - 57% 48% - 54% 55% - 59%	6% - 8% 8% - 11% 7% - 8%	22% - 29% 8% - 10% 25% - 30%	4% - 5% 7% - 9% 4% - 5%	1.5 - 2.5
High (3)	a b c	≥ 1.38 ≥ 1.33 ≥ 1.10	≥ 57% ≥ 54% ≥ 59%	≥ 8% ≥ 11% ≥ 8%	≥ 29% ≥ 10% ≥ 30%	≥ 5% ≥ 9% ≥ 5%	≥ 2.5

a: 2 or 3 or 4 Lane Divided Highway
b: 4 or 5 Lane Undivided Highway
c: 2 or 3 Lane Undivided Highway

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Freight Needs Refinements and Contributing Factors

- No changes were made to the level of need to account for hot spots or recently completed projects
- There are three bridge vertical clearance hot spots on the corridor all within Segment 80-8: Mule Pass Tunnel, Lowell RR UP (both directions)
- See **Appendix D** for detailed information on contributing factors

Table 16: Final Freight Needs

Segment	Performance Score and Level of Need								Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Freight Index	Directional TTTI		Directional TPTI		Closure Duration		Bridge Vertical Clearance				
		NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB					
90-1[b]	0.16	2.00	1.86	9.35	3.29	0.00	0.00	No UP	2.7	None	None	High
90-2[b]	0.27	1.59	1.00	6.45	1.08	10.51	1.87	No UP	1.3	None	None	Low
90-3[b]	0.35	1.11	1.05	2.96	2.70	17.07	32.50	No UP	0.0	None	None	None
90-4[a]	0.26	1.10	1.14	2.63	5.11	38.72	18.84	No UP	3.6	None	None	High
90-5[b]	0.17	1.41	1.40	5.46	6.42	0.00	87.57	No UP	2.5	None	None	High
90-6[b]	0.32	1.23	1.22	3.37	2.83	10.45	54.73	No UP	0.0	None	None	None
80-7[a]	0.53	1.02	1.27	1.44	2.31	10.90	190.07	No UP	3.9	None	None	High
80-8[b]	0.46	1.10	1.19	2.22	2.14	0.00	104.93	13.95	0.8	Mule Pass Tunnel (14.0 ft.); Lowell RR UP (both directions,13.95 ft. and 14.89 ft.)	None	Low
80-9[a]	0.63	1.08	1.05	1.76	1.41	0.00	19.00	No UP	3.4	None	None	High
80-10[b]	0.60	1.09	1.10	1.62	1.72	2.73	6.04	No UP	0.0	None	None	None

Level of Need (Score)		Performance Score Need Scale					Segment Level Need Scale
None* (0)	a b	≥ 0.74 ≥ 0.28	≤ 1.21 ≤ 1.53	≤ 1.37 ≤ 4.00	≤ 71.07	≥ 16.33	0
Low (1)	a b	0.70 - 0.74 0.22 – 0.28	1.21 - 1.27 1.53 - 1.77	1.37 - 1.43 4.00 - 5.00	71.07 - 97.97	16.17 - 16.33	≤ 1.5
Medium (2)	a b	0.64 - 0.70 0.12 – 0.22	1.27 - 1.39 1.77 - 2.23	1.43 - 1.57 5.00 - 7.00	97.97 - 151.75	15.83 - 16.17	1.5 - 2.5
High (3)	a b	≤ 0.64 ≤ 0.12	≥ 1.39 ≥ 2.23	≥ 1.57 ≥ 7.00	≥ 151.75	≤ 15.83	≥ 2.5

a: Uninterrupted Flow
b: Interrupted Flow

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Segment Review

The needs for each segment were combined to numerically estimate the average level of need for each segment of the corridor. **Table 17** provides a summary of needs for each segment across all performance areas, with the average need score for each segment presented in the last row of the table. A weighting factor of 1.5 is applied to the need scores of the performance areas identified as emphasis areas (Pavement, Safety, and Freight for the SR 90/SR 80 corridor). There is four segment with a Medium average need and six segments with a Low average need.

Table 17: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)									
	90-1	**90-2**	**90-3**	**90-4**	**90-5**	**90-6**	**80-7**	**80-8**	**80-9**	**80-10**
	MP 290-295	**MP 295-304**	**MP 304-312**	**MP 312-317**	**MP 317-324**	**MP 324-336**	**MP 333-339**	**MP 339-345**	**MP 345-357**	**MP 357-365**
Pavement*	None	None	Low	Low	Medium	None	None	Low	None	Low
Bridge	None	None	None	None	None	Low	Low	Low	Medium	Medium
Mobility	Low	Low	None	Low	Low	Low	Low	Low	Low	None
Safety*	N/A	None	Low	Low	Low	High	None	None	Low	Low
Freight*	High	Low	None	High	High	None	High	Low	High	None
Average Need	**0.85**	**0.38**	**0.46**	**1.31**	**1.54**	**1.00**	**1.00**	**0.77**	**1.38**	**0.77**

* Identified as Emphasis Areas for SR 90/SR 80 Corridor
[#] N/A indicates insufficient or no data available to determine level of need
[+] A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

Level of Need	Average Need Range
None[+]	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

Summary of Corridor

The needs in each performance area are shown in **Figure 21** and summarized below:

Pavement Needs

- Six segments (90-3, 90-4, 90-5, 80-7, 80-8, and 80-10) contain Pavement hot spots, but one of these segments (80-7) had recent paving projects that addressed the need
- Segment 90-5 has a final need of Medium and Segments 90-3, 90-4, 80-8, and 80-10 have final needs of Low; all other segments on the corridor have a final need of None
- No segments were identified as having potential pavement repetitive historical investment issues

Bridge Needs

- Two segments (90-6 and 80-9) have bridge hot spots but do not have potential repetitive historical investment issues
- Two segments (80-7 and 80-8) have bridges considered to be functionally obsolete
- Segments 90-1, 90-4, and 90-5 do not contain any bridges
- Segments 80-9 and 80-10 final needs of Medium; Segments 90-6, 80-7, and 80-8 have final needs of Low; all other segments on the corridor have a final need of None

Mobility Needs

- Segments 90-3 and 80-10 have a final segment need of None; all other segments on the corridor have a final segment need of Low
- Mobility needs are primarily related to high PTI and lack of bicycle accommodation

Safety Needs

- Segment 90-6 has a final segment need of High; Segment 90-1 has a final segment need of N/A due to insufficient data in order to generate reliable ratings; Segments 90-2, 80-7, and 80-8 has final segment needs of None; all other segments on the corridor have a final need of Low
- Safety hot spots exist in Segments 90-4 and 90-5
- There is insufficient data to generate reliable ratings for the secondary measures including SHSP Top 5 Emphasis Area crashes and crashes involving trucks, motorcycles, and non-motorized travelers

Freight Needs

- There are three bridge vertical clearance hot spots along the corridor: Mule Pass Tunnel and Lowell RR UP (both directions)
- Segments 90-1, 90-4, 90-5, and 80-7 have a final segment need of High while Segment 80-9 has a final segment need of Medium; all other segments on the corridor have a final segment need of Low or None

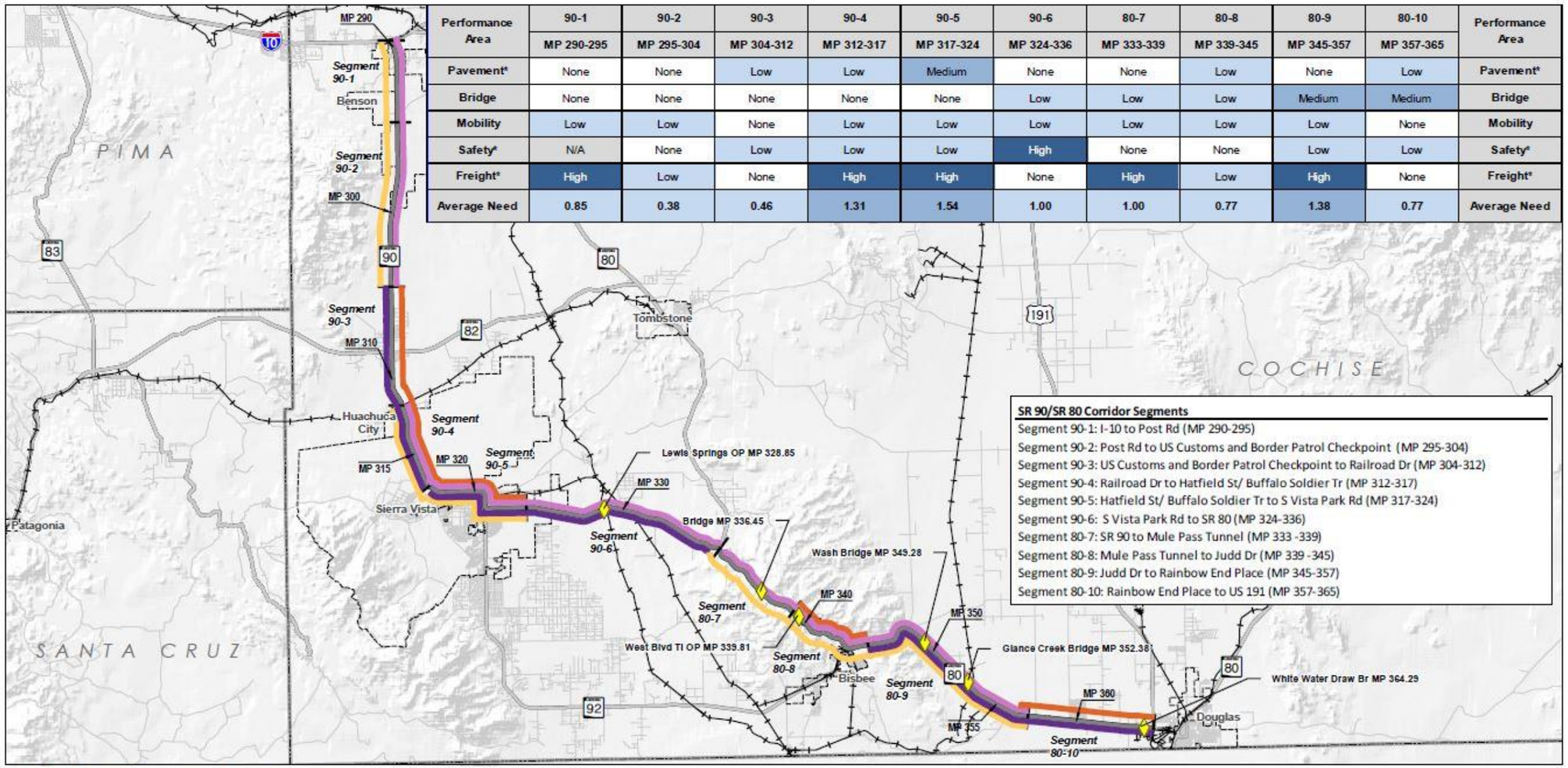
Overlapping Needs

This section identifies overlapping performance needs on the SR 90/SR 80 corridor, which provides guidance to develop strategic solutions that address more than one performance area with elevated levels of need (i.e., Medium or High). Completing projects that address multiple needs presents the opportunity to more effectively improve overall performance. A summary of the overlapping needs that relate to locations with elevated levels of need is provided below:

- Segments 90-5 contains elevated needs in the Pavement and Freight performance areas
- Segment 80-9 contains elevated needs in the Bridge and Freight performance areas

Figure 21 Corridor Needs Summary

Performance Area	90-1	90-2	90-3	90-4	90-5	90-6	80-7	80-8	80-9	80-10	Performance Area
	MP 290-295	MP 295-304	MP 304-312	MP 312-317	MP 317-324	MP 324-336	MP 333-339	MP 339-345	MP 345-357	MP 357-365	
Pavement*	None	None	Low	Low	Medium	None	None	Low	None	Low	Pavement*
Bridge	None	None	None	None	None	Low	Low	Low	Medium	Medium	Bridge
Mobility	Low	Low	None	Low	Low	Low	Low	Low	Low	None	Mobility
Safety*	N/A	None	Low	Low	Low	High	None	None	Low	Low	Safety*
Freight*	High	Low	None	High	High	None	High	Low	High	None	Freight*
Average Need	0.85	0.38	0.46	1.31	1.54	1.00	1.00	0.77	1.38	0.77	Average Need



* Identified as Emphasis Areas for SR 90/SR 80 Corridor
# N/A indicates insufficient or no data available to determine level of need
+ A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

Miles 0 5 10 N

Corridor Segment
County Boundary
Interstate/Highway
City Boundary
Railroad

Performance Area Needs
Pavement
Mobility
Safety
Freight
Bridge

Level of Need	Average Need
None+	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Needs Summary

Appendix A: Corridor Performance Maps

This appendix contains maps of each primary and secondary measure associated with the five performance areas for the SR 90/SR 80 corridor. The following are the areas and maps included:

Pavement Performance Area:

- Pavement Index and Hot Spots
- Pavement Serviceability (directional)
- Percentage of Pavement Area Failure

Bridge Performance Area:

- Bridge Index and Hot Spots
- Bridge Sufficiency
- Percent of Deck Area on Functionally Obsolete Bridges
- Lowest Bridge Rating

Mobility Performance Area:

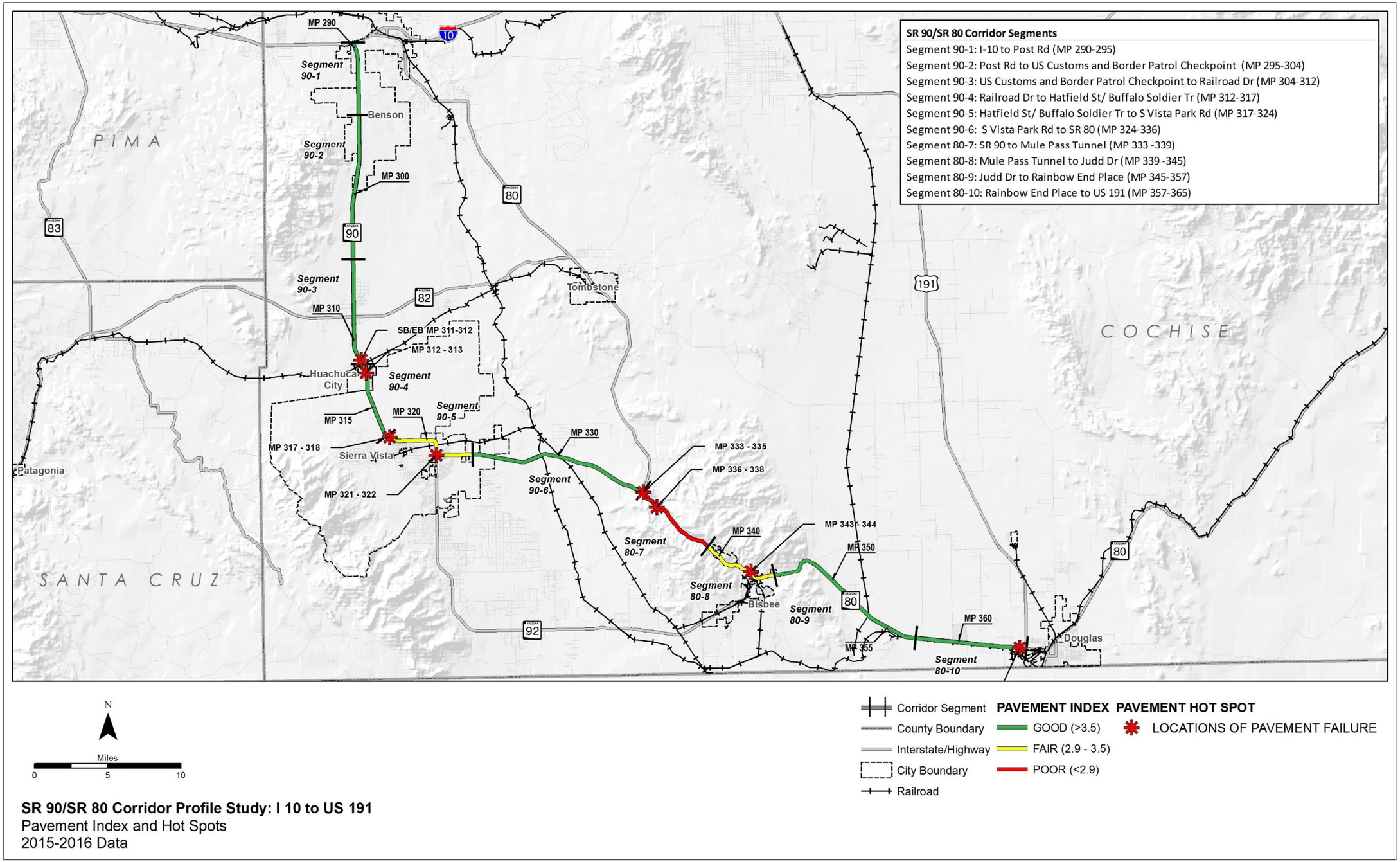
- Mobility Index
- Future Daily V/C
- Existing Peak V/C (directional)
- Average Instances Per Year a Given Milepost is Closed Per Segment Mile
- All Vehicles Travel Time Index
- All Vehicles Planning Time Index
- Multimodal Opportunities
- Percentage of Bicycle Accommodation

Safety Performance Area:

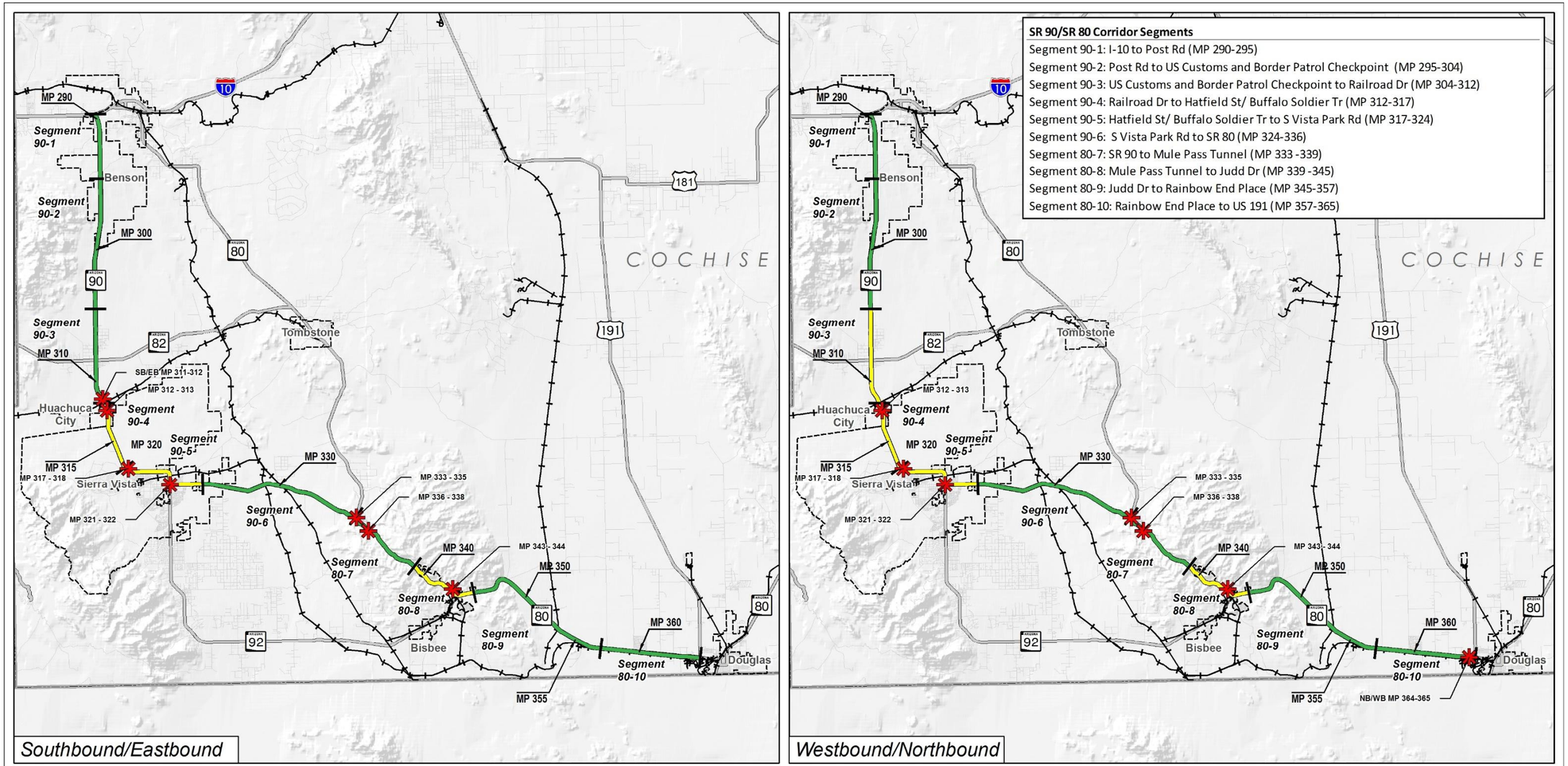
- Safety Index and Hot Spots
- Safety Index and Hot Spots (directional)

Freight Performance Area:

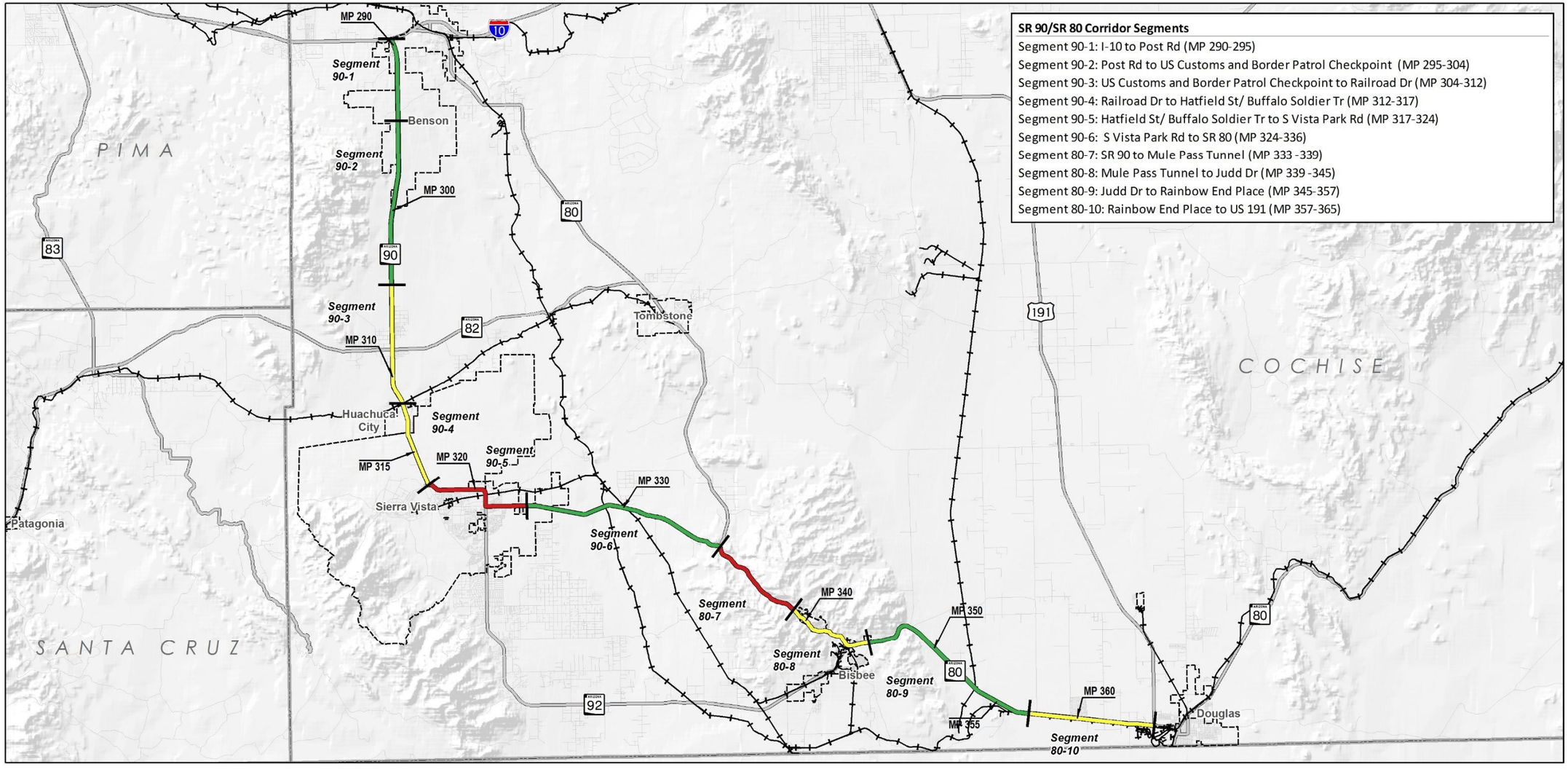
- Freight Index and Hot Spots
- Truck Travel Time Index
- Truck Planning Time Index
- Average Minutes Per Year Given Milepost is Closed Per Segment Mile
- Bridge Vertical Clearance



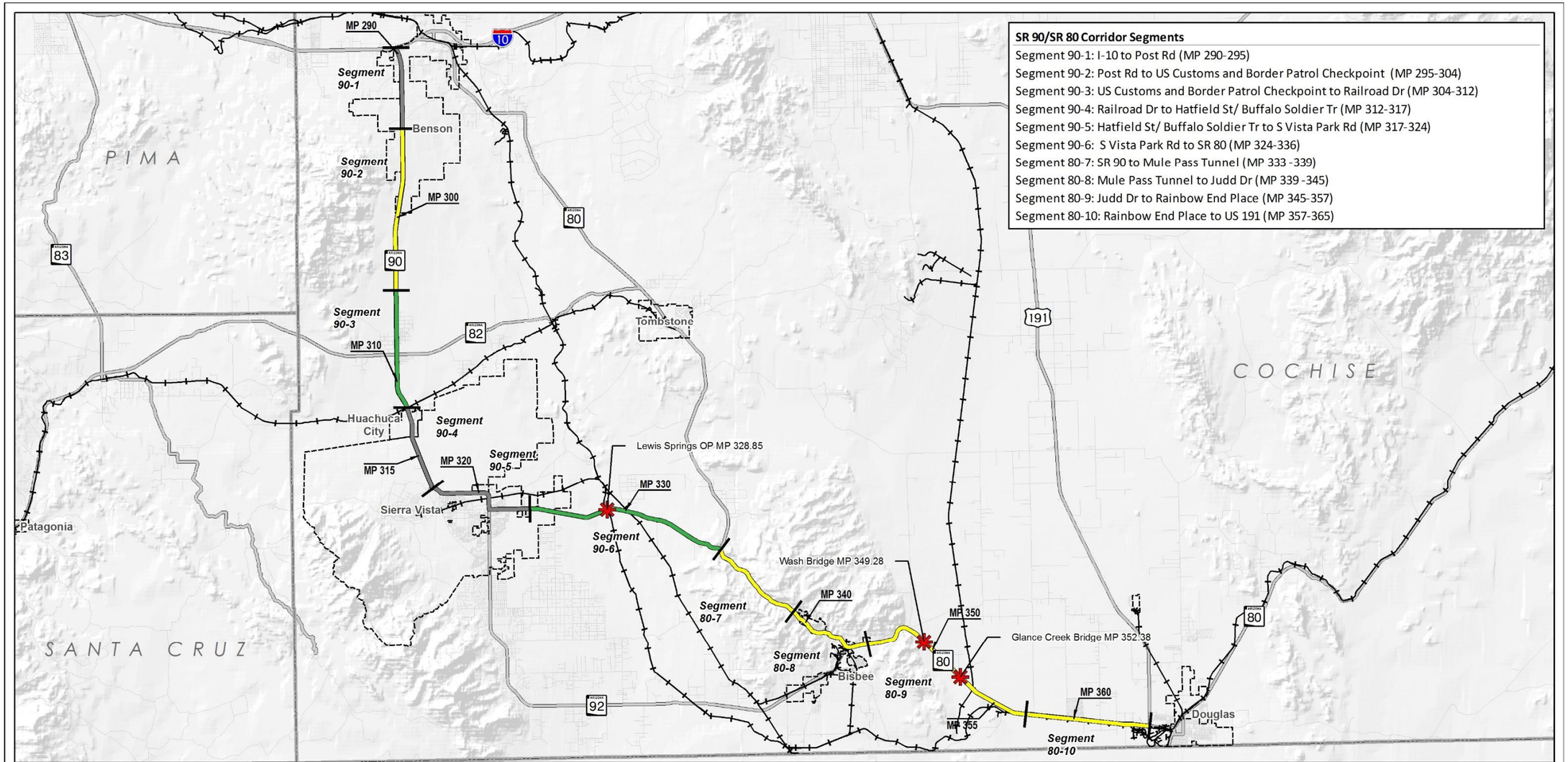
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Pavement Index and Hot Spots
2015-2016 Data



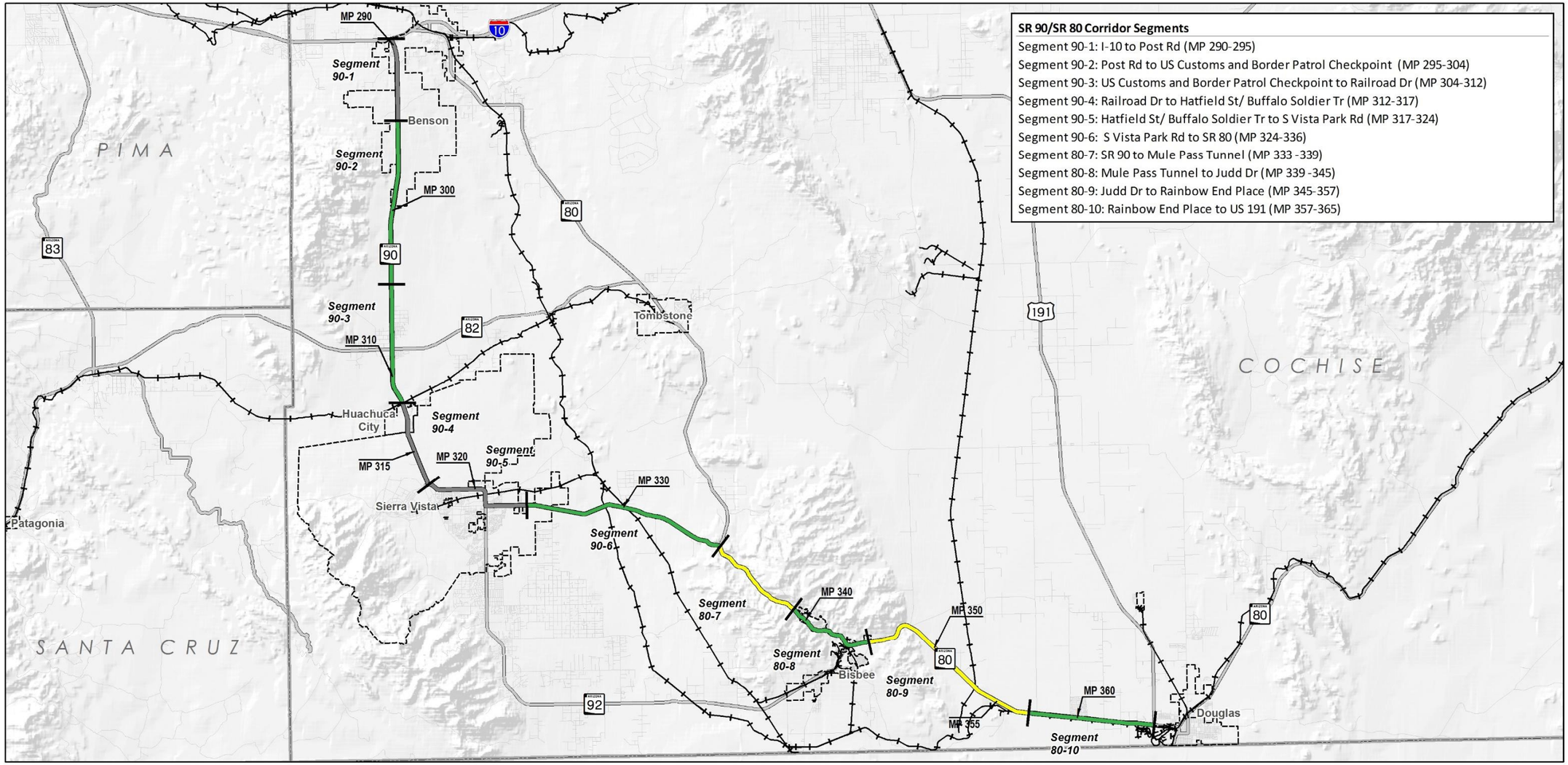
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Pavement Serviceability and Hot Spots
2015-2016 Data



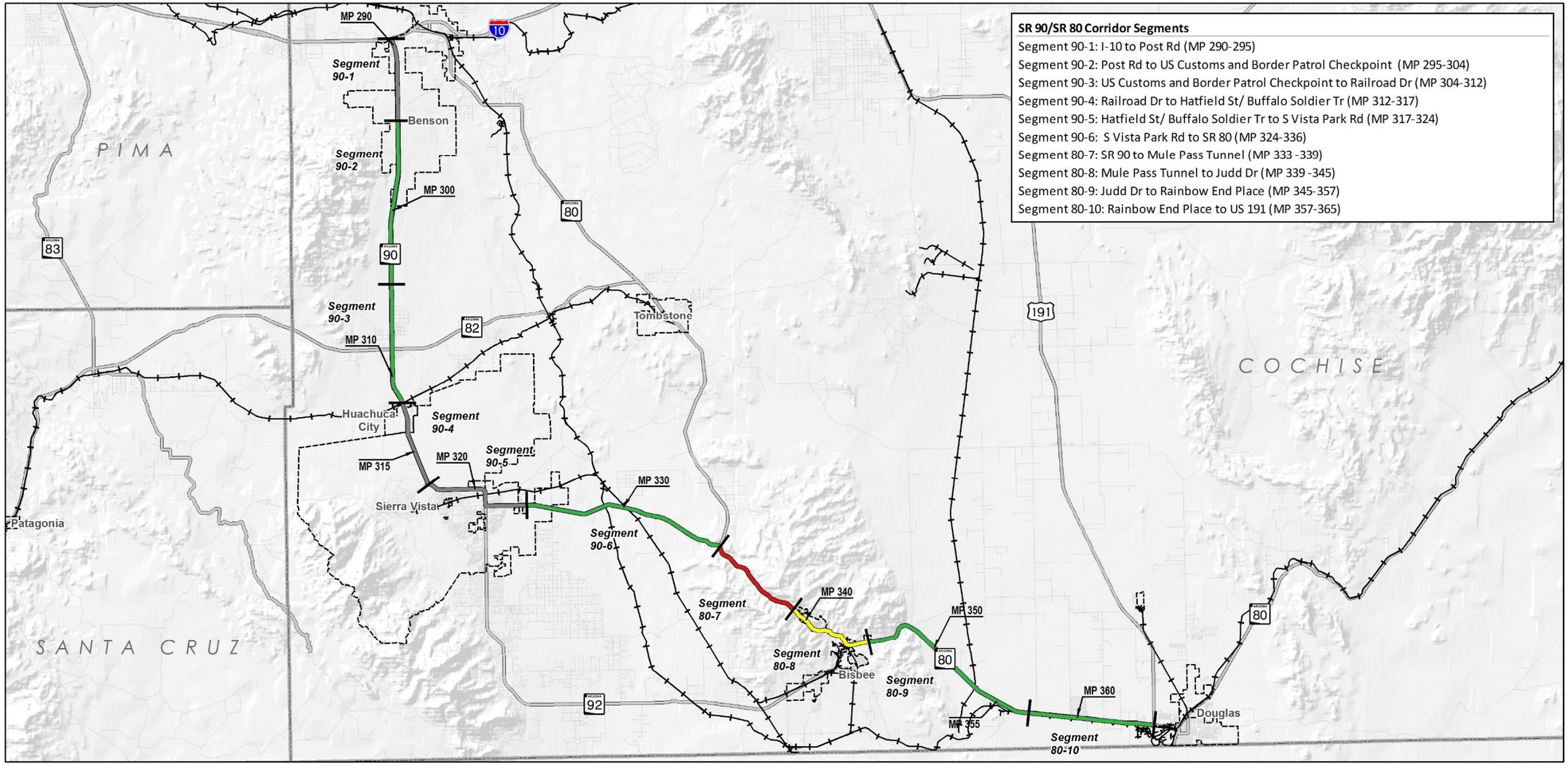
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Percentage of Pavement Area Failure
2015-2016 Data



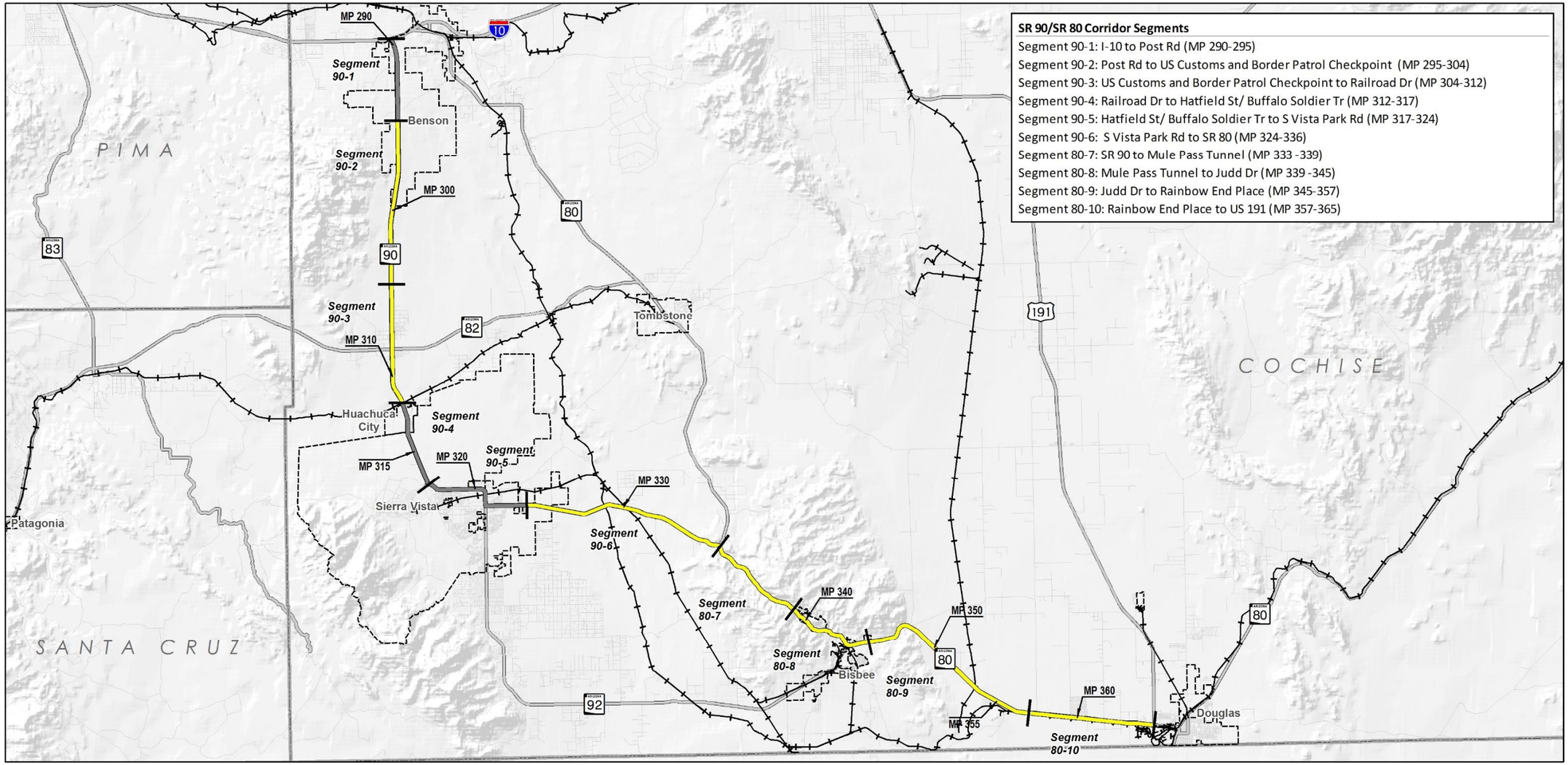
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Bridge Index and Hot Spots
2016 Data



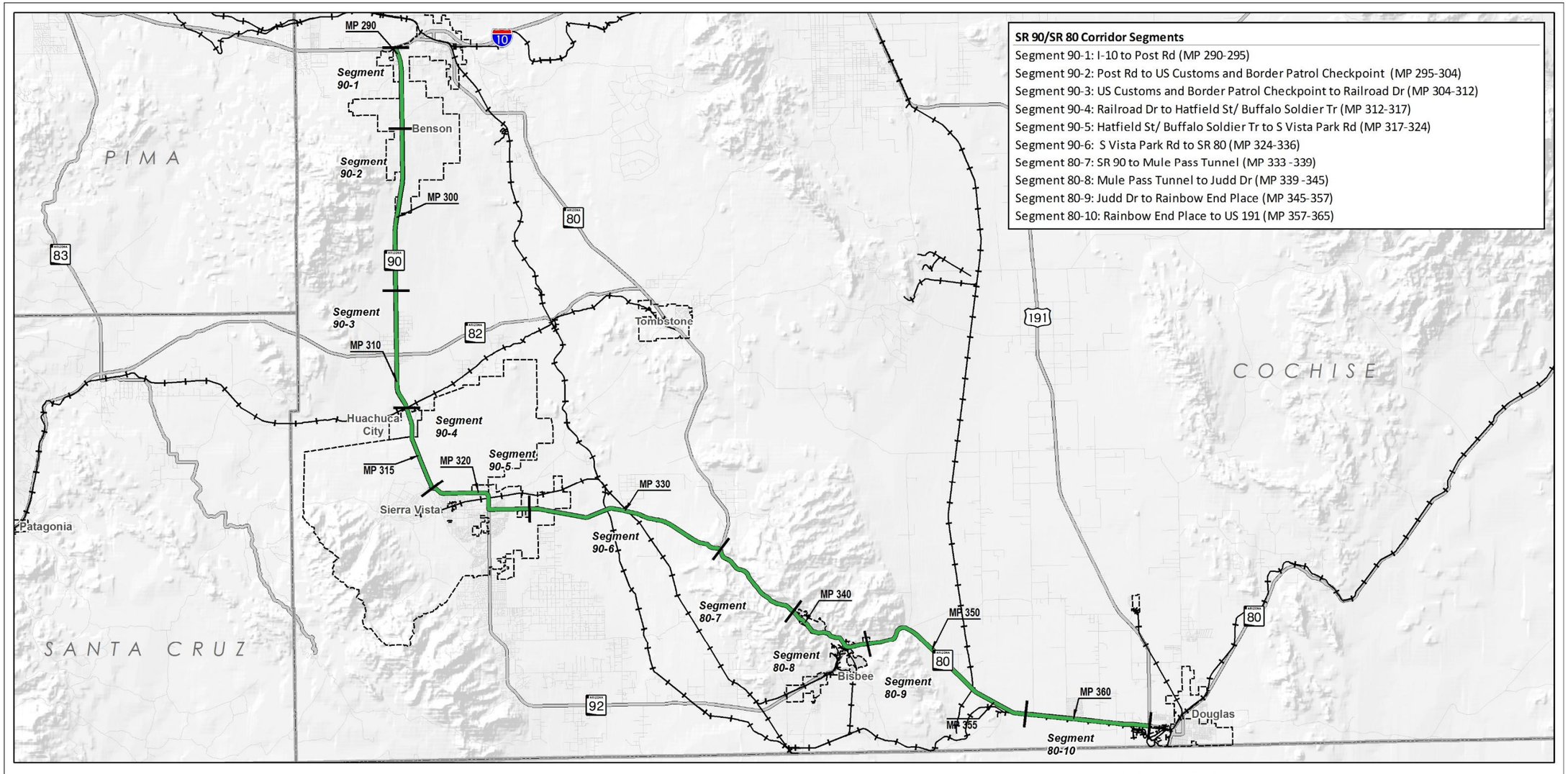
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Bridge Sufficiency
2016 Data



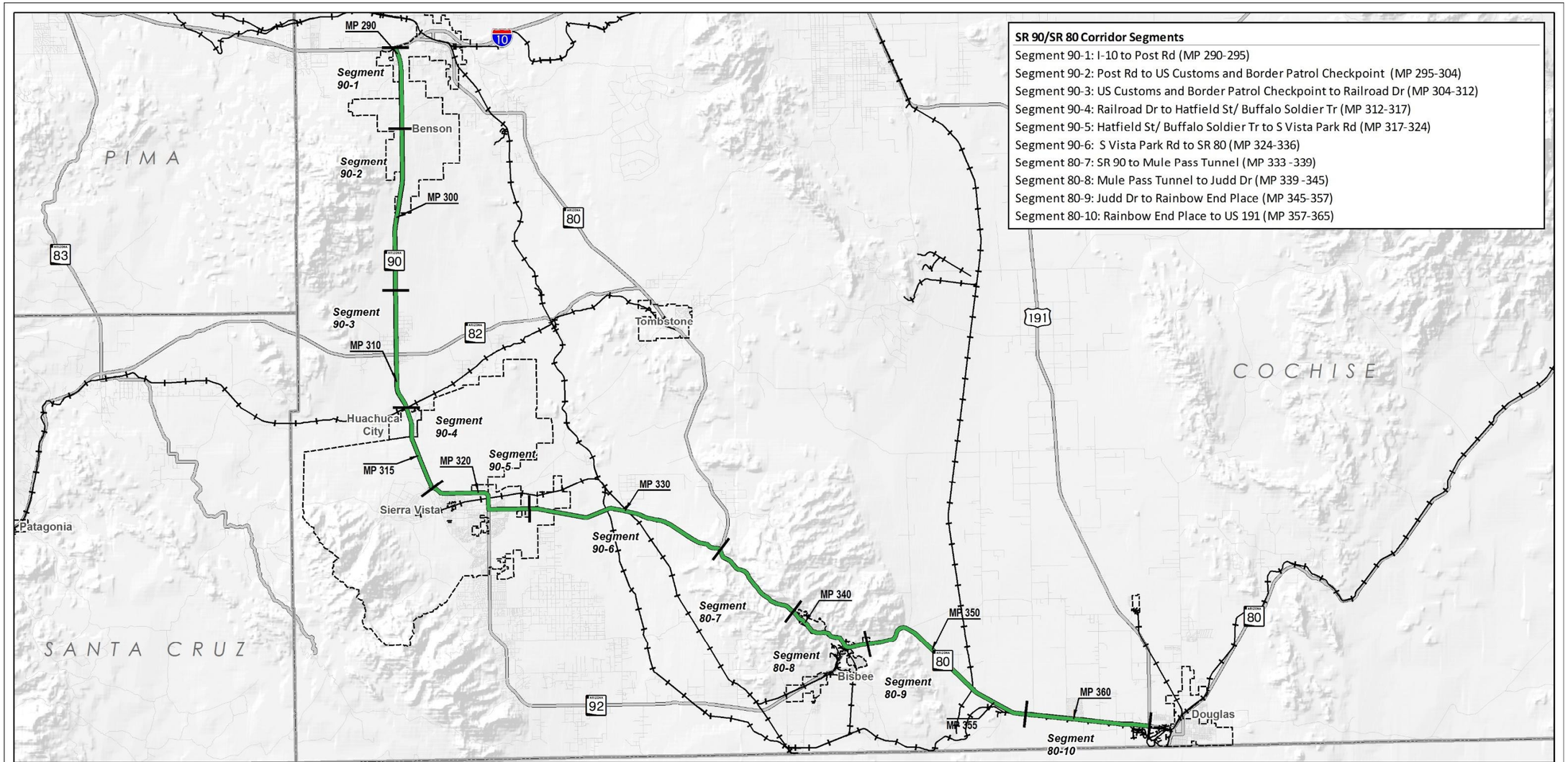
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Percentage of Deck Area on Functionally Obsolete Bridges
2016 Data



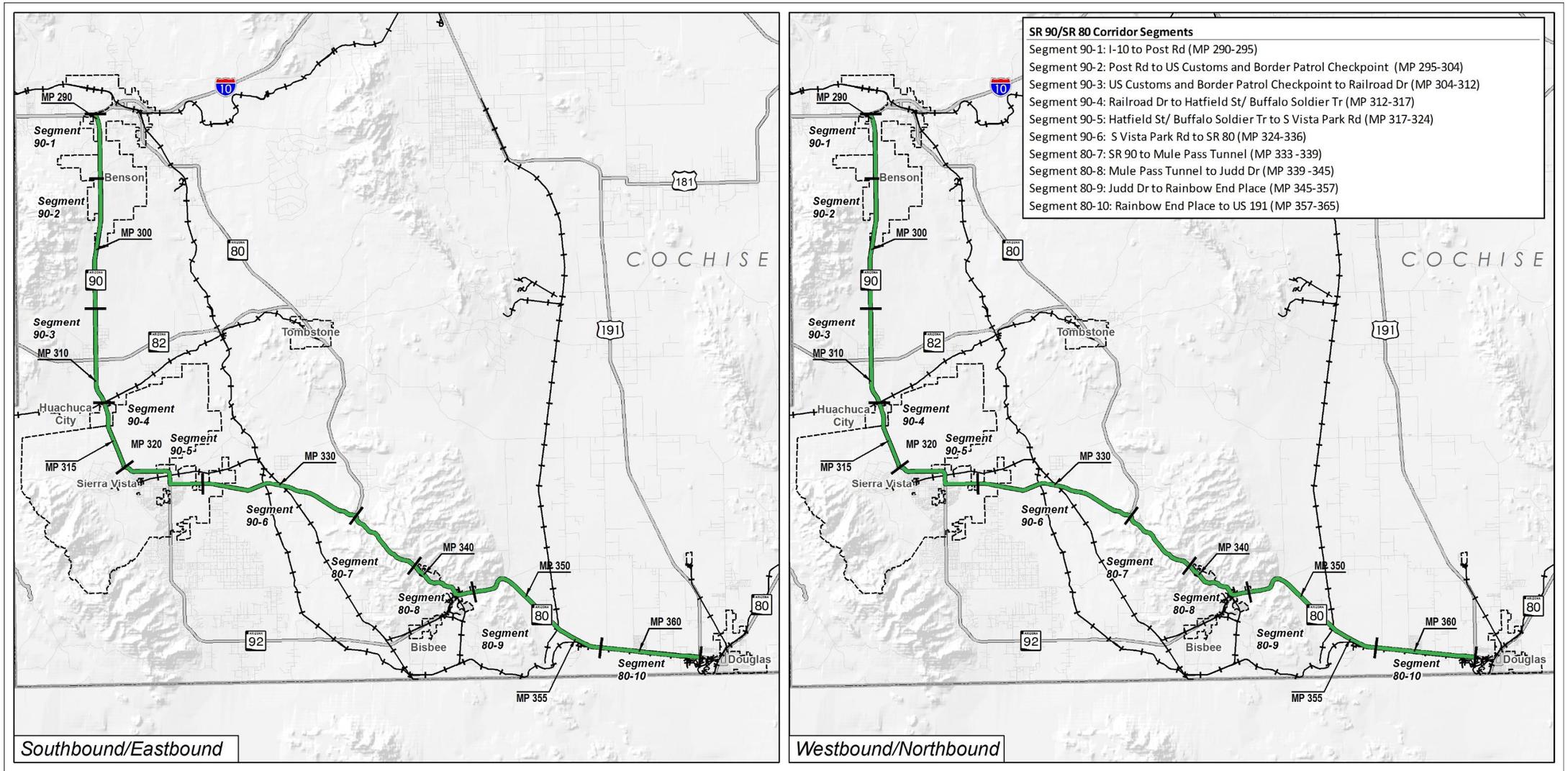
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Lowest Bridge Rating
2016 Data



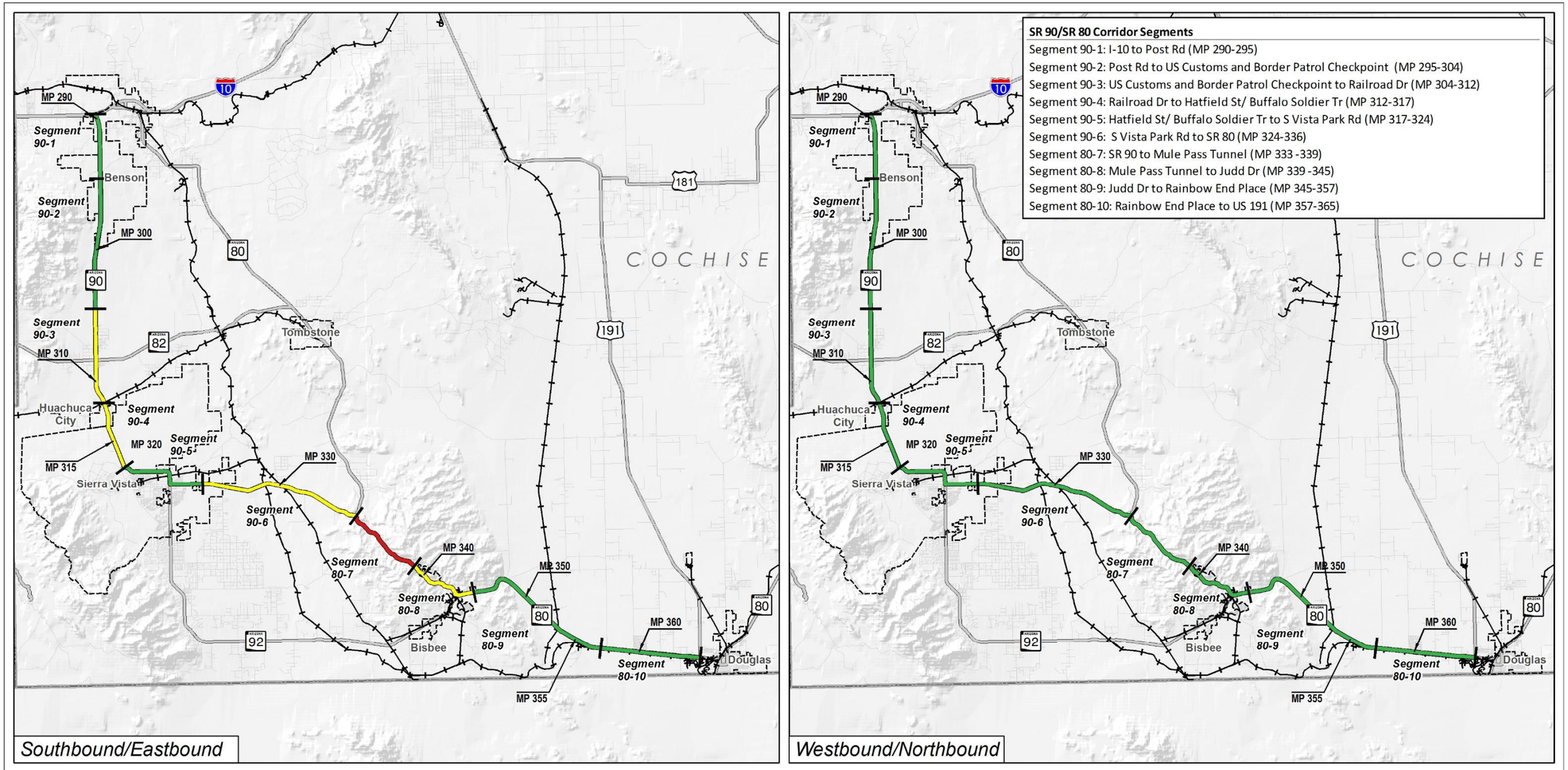
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Mobility Index
2015 and 2035 Data



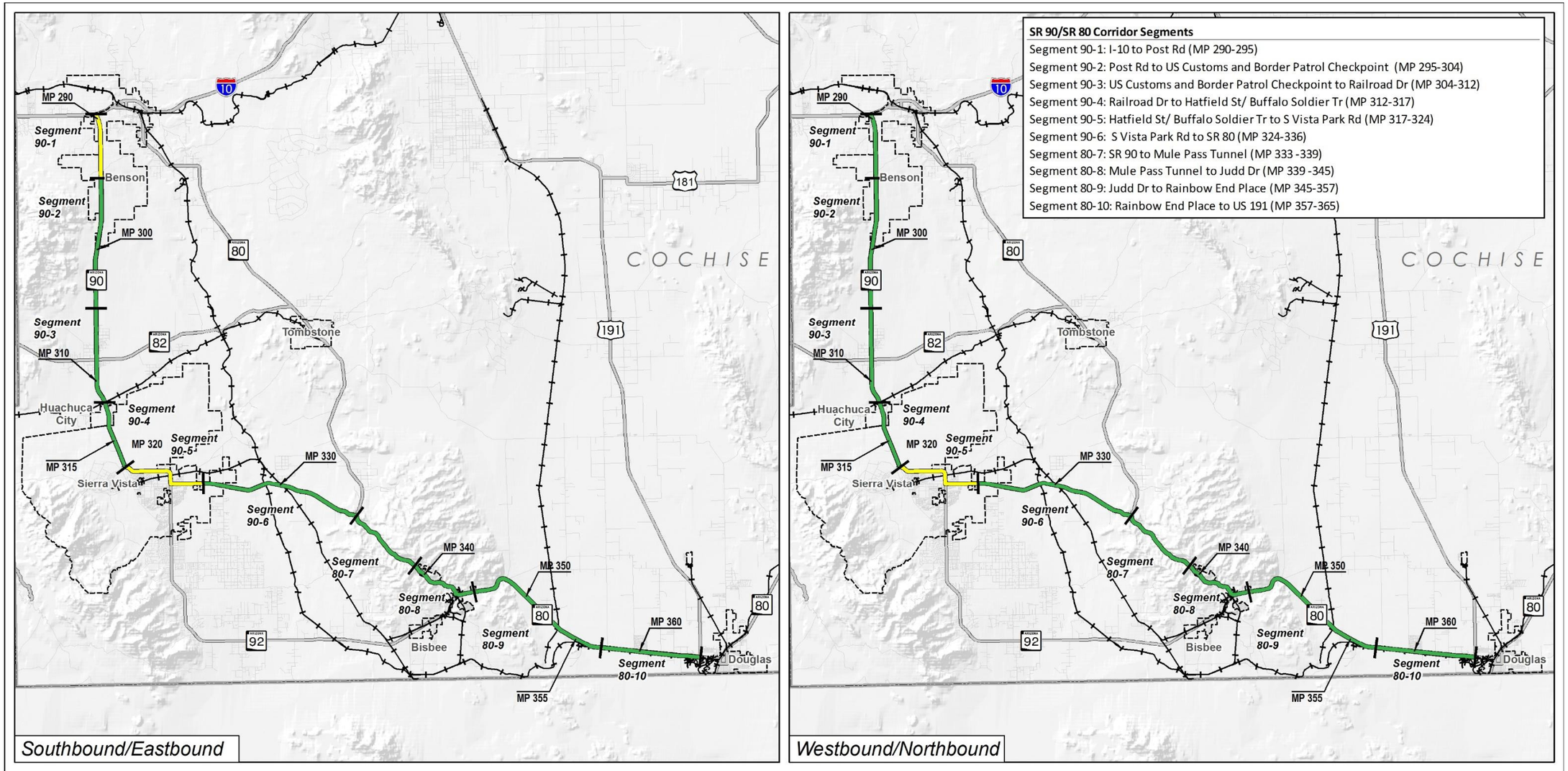
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Future Daily Volume/Capacity (V/C) Ratio
2035 Data



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Existing Peak Hour V/C
2015 Data



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Average Instances Per Year A
Given Milepost Is Closed Per Segment Mile
2011 - 2015 Data


SR 90/SR 80 Corridor Segments
Segment 90-1: I-10 to Post Rd (MP 290-295)
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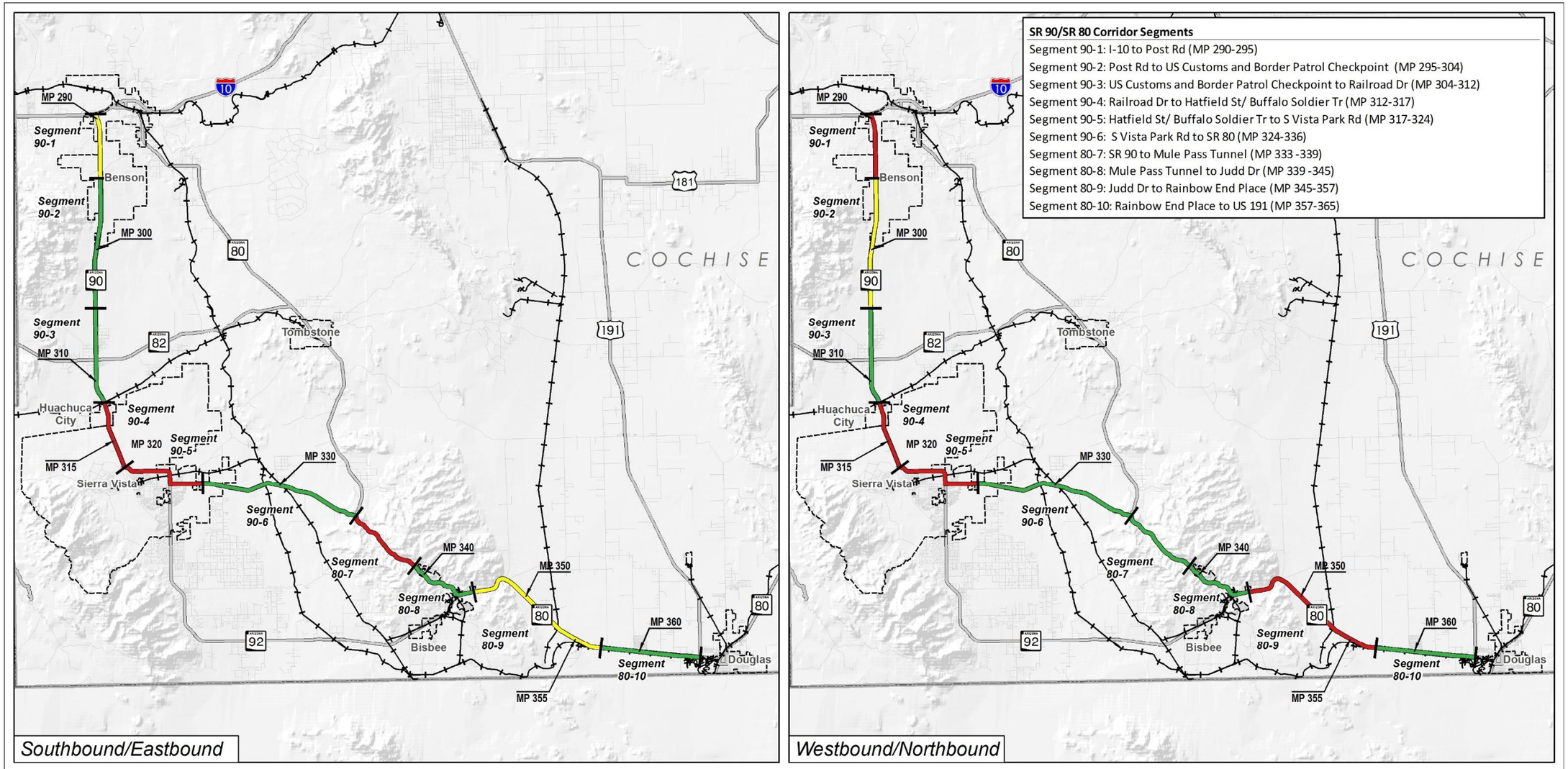
Segment 80-9: Judd Dr to Rainbow End Place (MP 345-357)
Segment 80-10: Rainbow End Place to US 191 (MP 357-365)
MP 290
Segment 90-1
Benson
Segment 90-2
MP 300
MP 310
Segment 90-3
Tombstone
Huachuca City
Segment 90-4
MP 315
MP 320
Segment 90-5
Sierra Vista
MP 330
Segment 90-6
MP 340
Segment 80-7
MP 350
Segment 80-8
Bisbee
Segment 80-9
MP 355
MP 360
Segment 80-10
Douglas
COCHISE
10
181
191
80
90
82
92
Southbound/Eastbound
Westbound/Northbound
N
Miles
0
5
10
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
All Vehicles Travel Time Index
2015 Data
Corridor Segment
County Boundary
Interstate/Highway
City Boundary
Railroad
ALL VEHICLES TRAVEL TIME INDEX
UNINTERRUPTED (SEGMENTS 90-4, 80-7, 80-9)
GOOD (<1.15)
FAIR (1.15 - 1.33)
POOR (>1.33)
INTERRUPTED (SEGMENTS 90-1, 90-2, 90-3 90-5, 90-6, 80-8, 80-10)
GOOD (<1.3)
FAIR (1.3 - 2.0)
POOR (>2.0)


SR 90/SR 80 Corridor Segments
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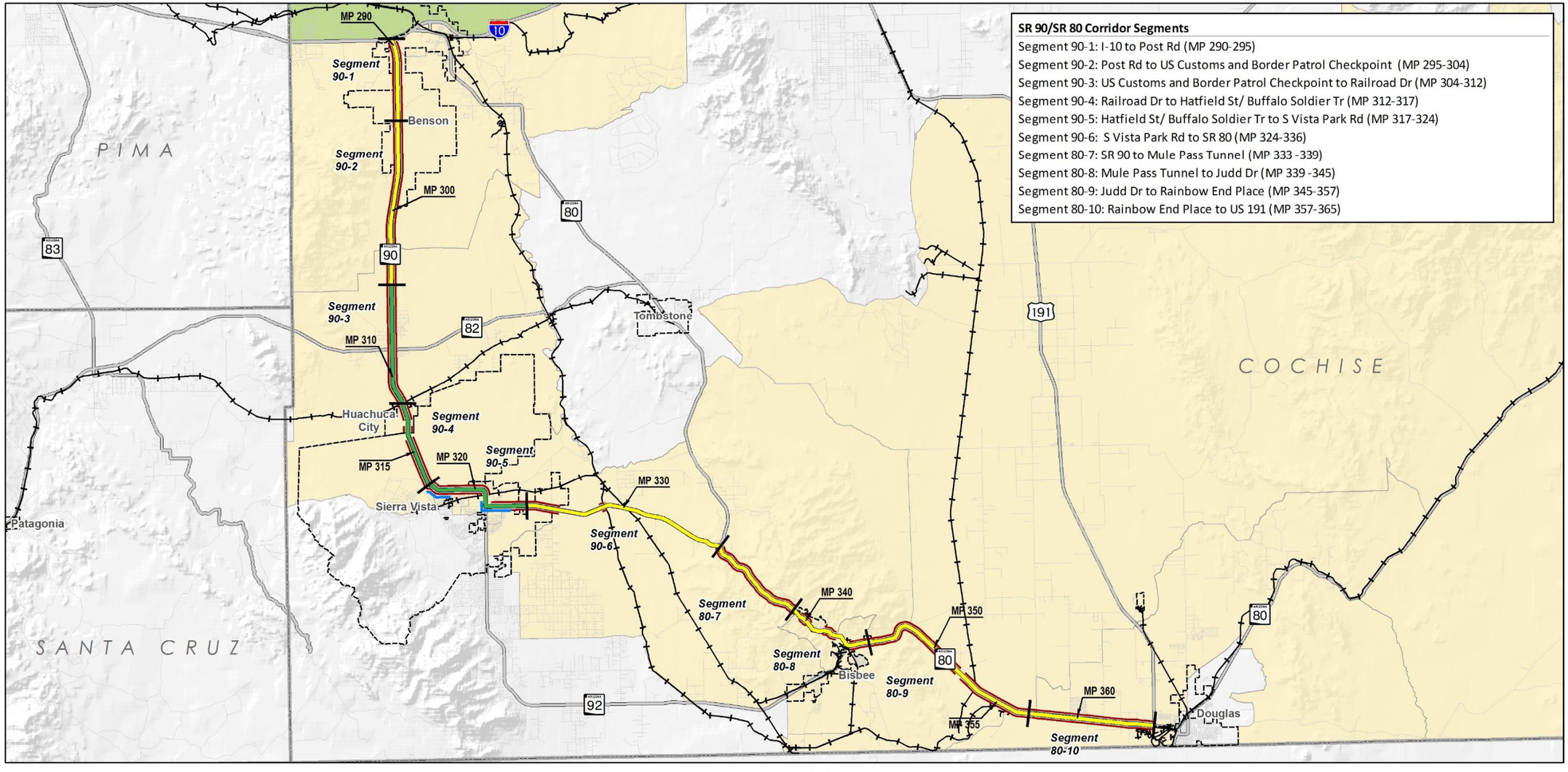
MP 340
Segment 80-7
Segment 80-8
MP 350
Segment 80-9
MP 355
MP 360
Segment 80-10
Bisbee
Douglas
COCHISE
10
181
191
80
90
82
92
Southbound/Eastbound
Westbound/Northbound
N
Miles
0
5
10
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
All Vehicles Planning Time Index
2015 Data
Corridor Segment
County Boundary
Interstate/Highway
City Boundary
Railroad
ALL VEHICLES PLANNING TIME INDEX
UNINTERRUPTED (SEGMENTS 90-4, 80-7, 80-9)
GOOD (<1.3)
FAIR (1.3 - 1.5)
POOR (>1.5)
INTERRUPTED (SEGMENTS 90-1, 90-2, 90-3 90-5, 90-6, 80-8, 80-10)
GOOD (<3.0)
FAIR (3.0 - 6.0)
POOR (>6.0)



SR 90/SR 80 Corridor Segments

Segment 90-1: I-10 to Post Rd (MP 290-295)
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Segment 80-9: Judd Dr to Rainbow End Place (MP 345-357)
Segment 80-10: Rainbow End Place to US 191 (MP 357-365)

N

Miles
0 5 10

SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Multimodal Opportunities
2015 Data

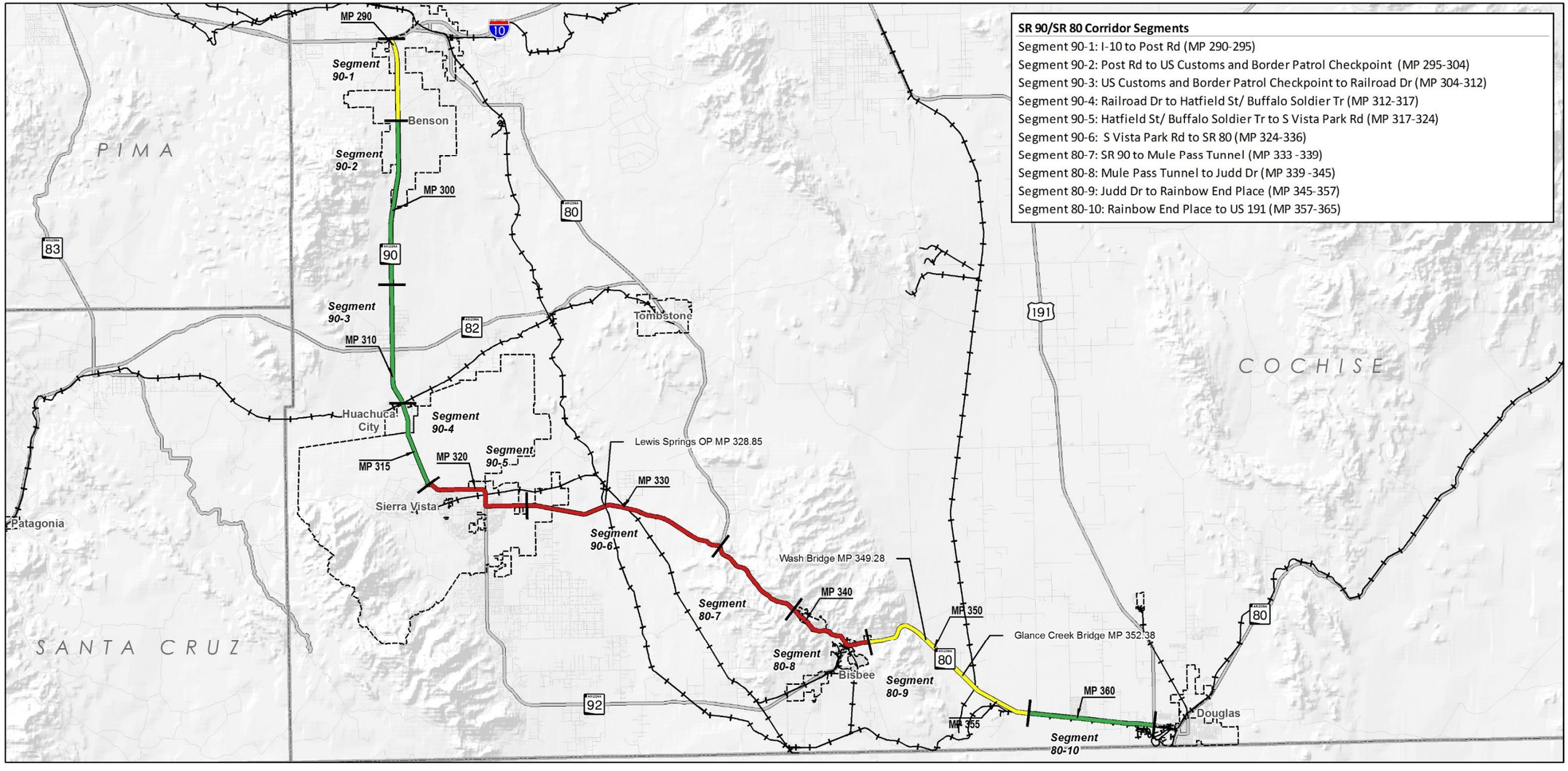
Corridor Segment
County Boundary
Interstate/Highway
City Boundary
Railroad
Shared Use Path
Shoulder ≥ 4 Feet

Average Non-Single Occupancy Vehicle Trips by Corridor Segment:

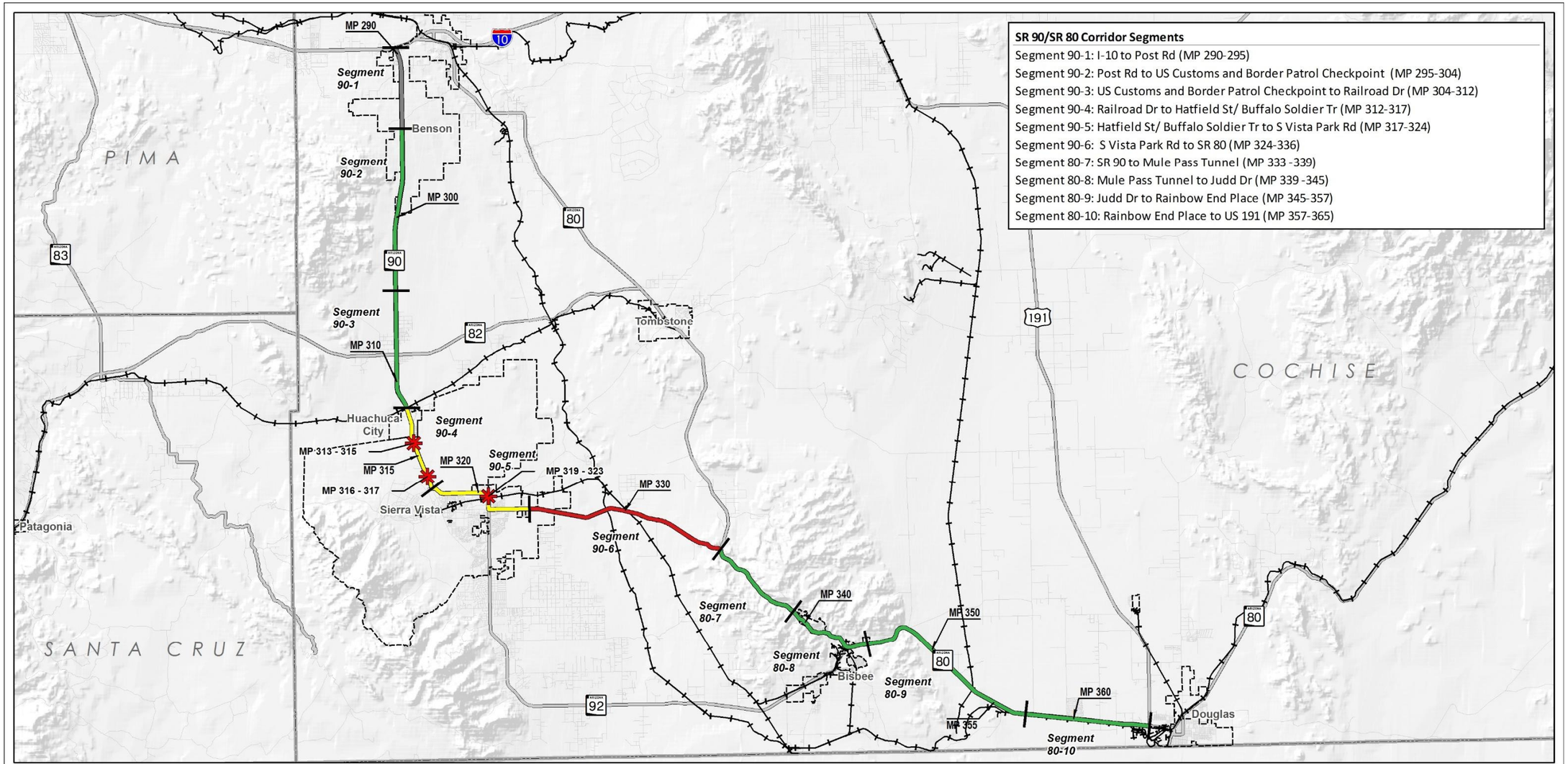
Segments ABOVE the state wide average for Non-Single Occupancy Vehicle Trips
Segments WITHIN the state wide average for Non-Single Occupancy Vehicle Trips
Segments BELOW the state wide average for Non-Single Occupancy Vehicle Trips

Census Tracts of Zero/One Vehicle Households and Population in Poverty

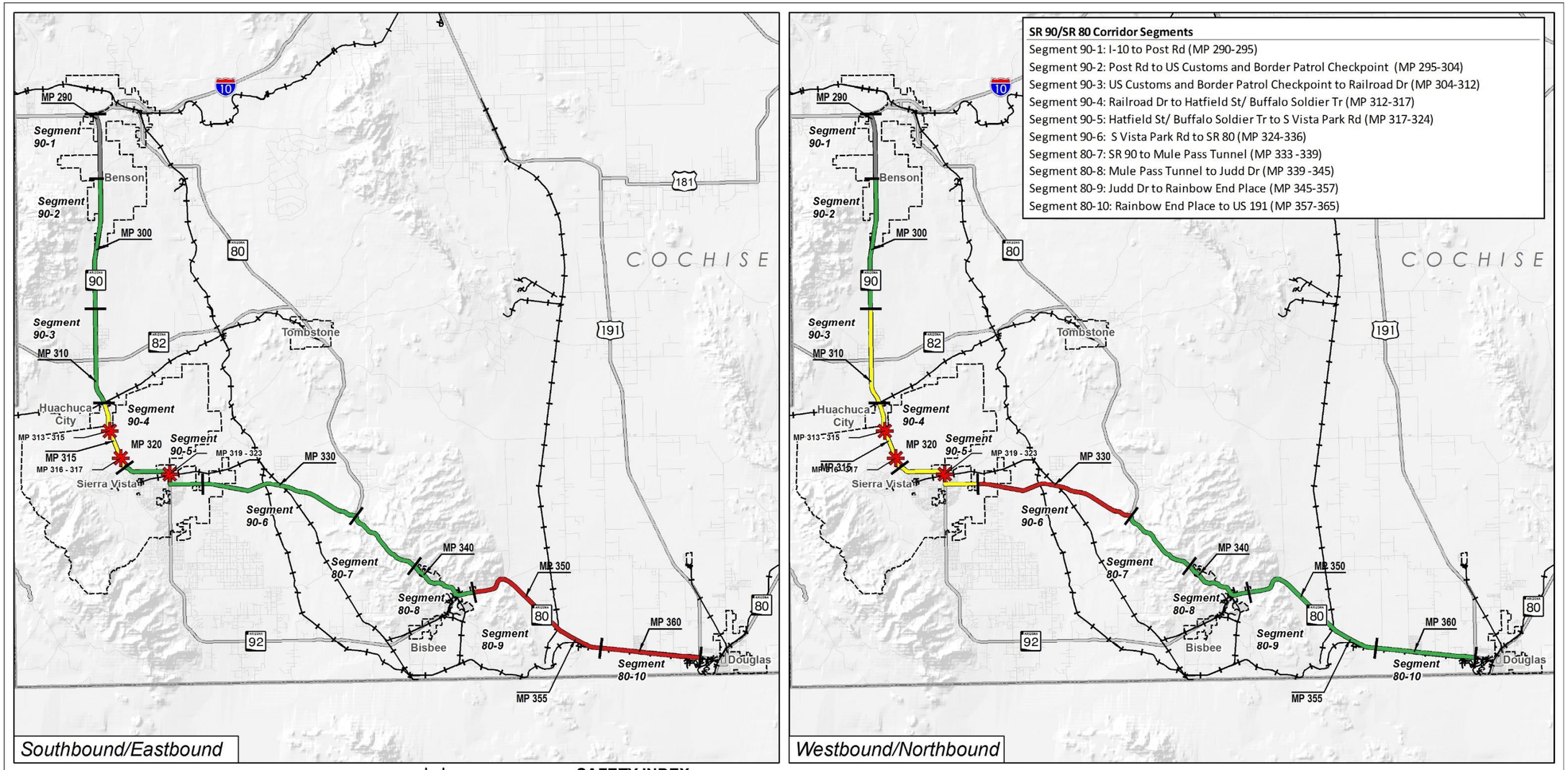
Tracts ABOVE the Arizona statewide average range
Tracts WITHIN the Arizona statewide average range
Tracts BELOW the Arizona statewide average range



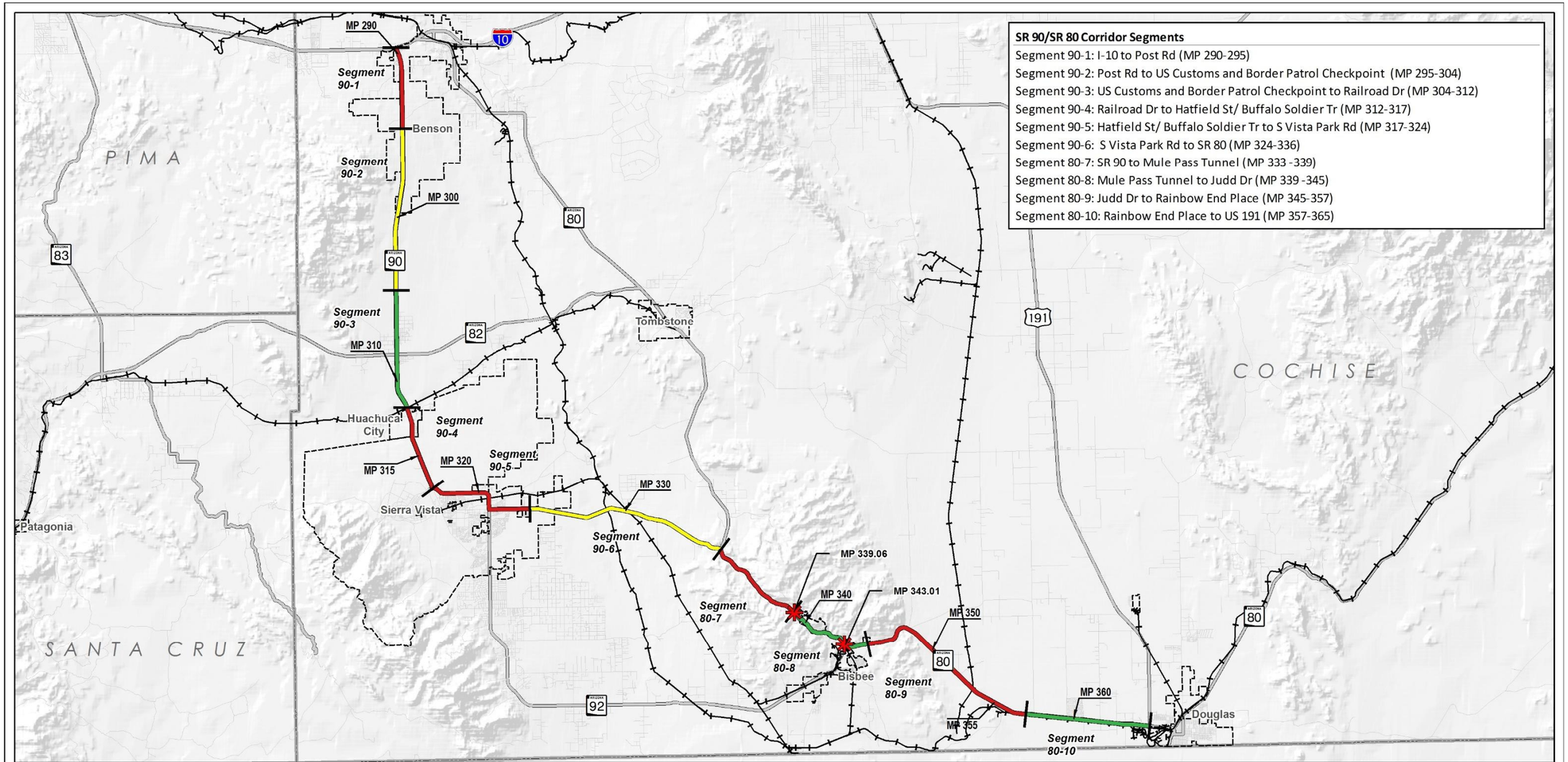
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Percentage of Bicycle Accommodation
2015 Data



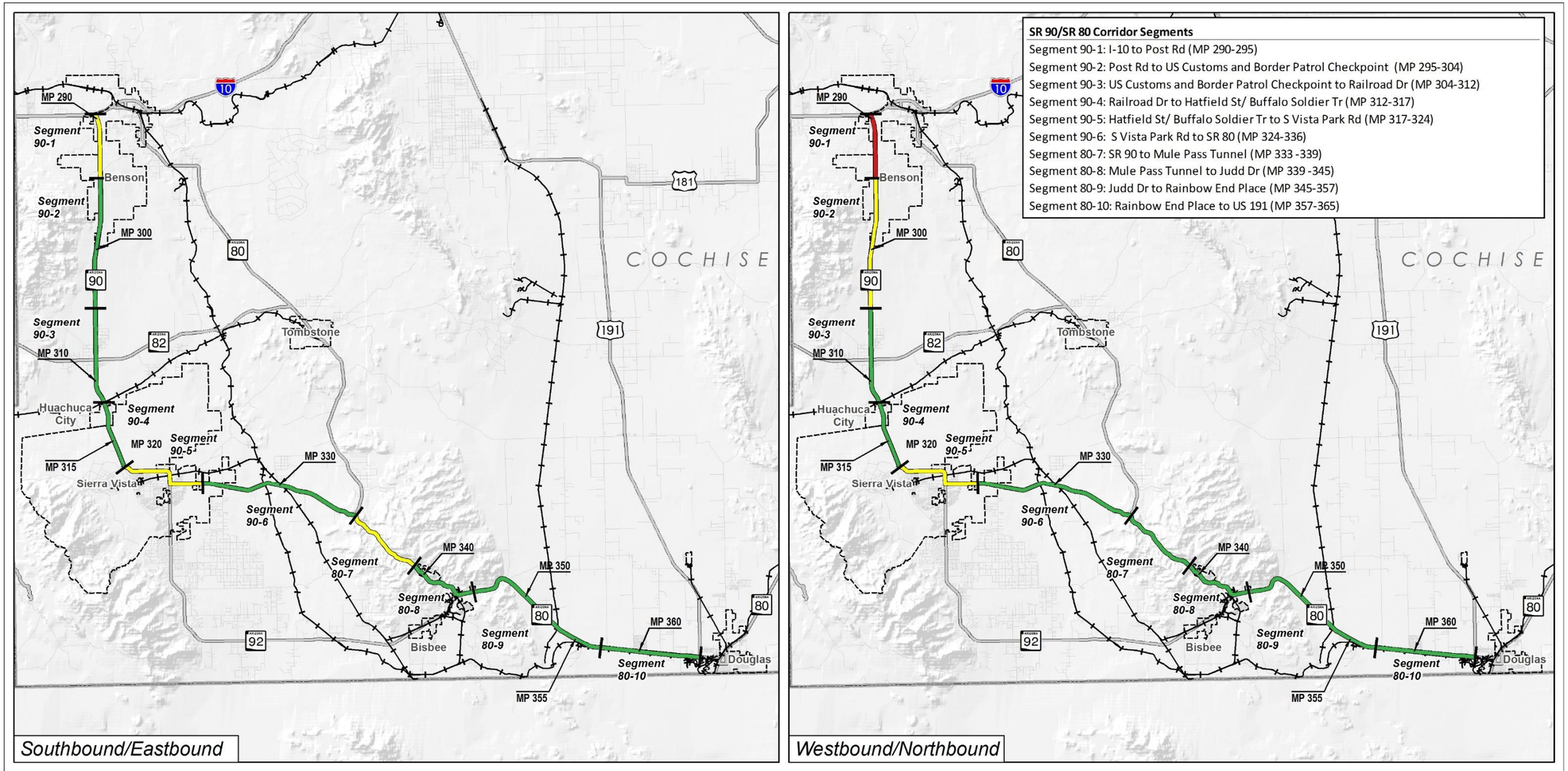
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Safety Index and Hot Spots
2011 - 2015 Data



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Directional Safety Index and Hot Spots
2011 - 2015 Data



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Freight Index and Hot Spots
2015 Data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MP 360
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92
Southbound/Eastbound
Westbound/Northbound
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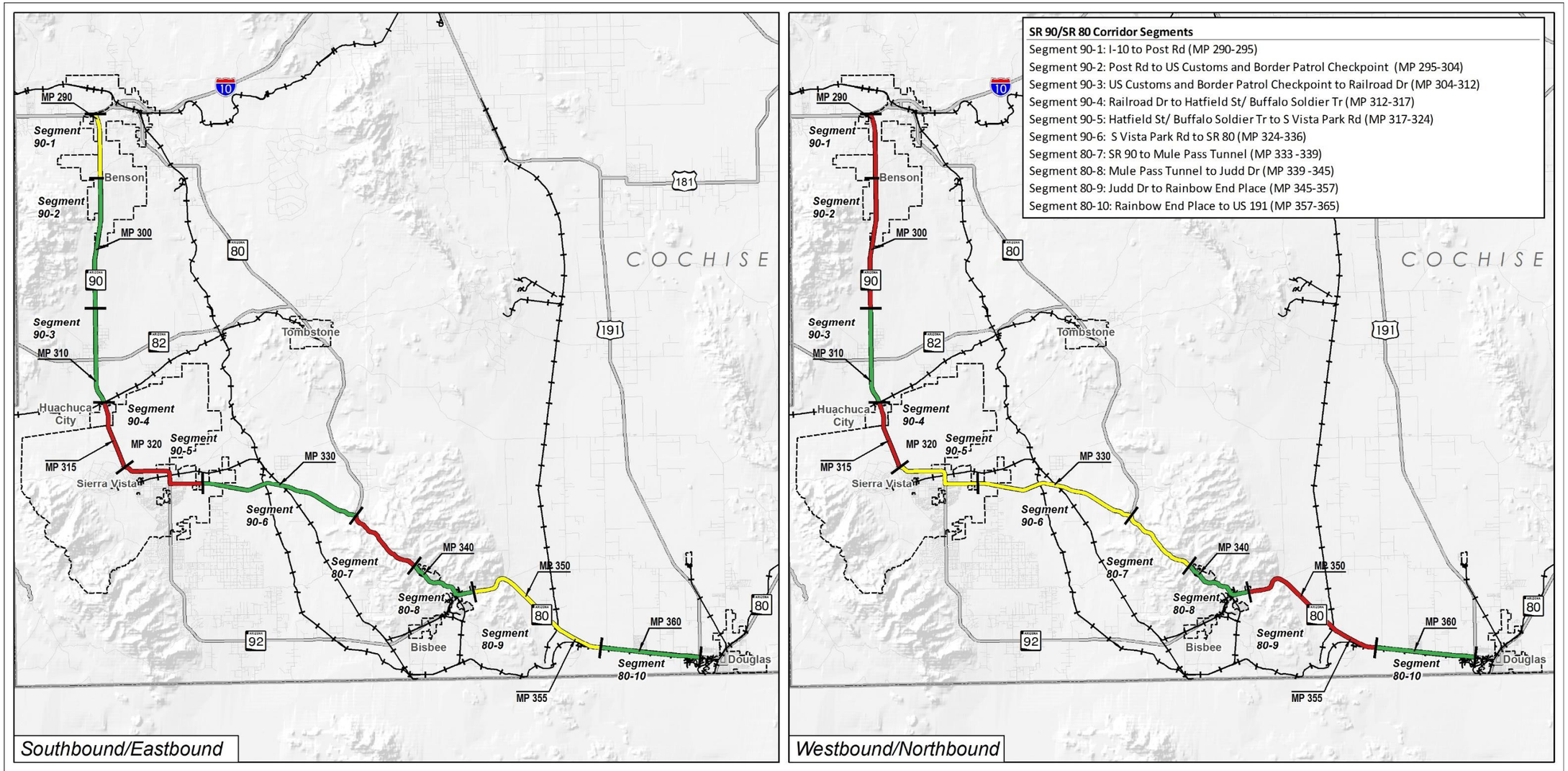
Miles
0
5
10
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Truck Travel Time Index
2015 Data
Corridor Segment
County Boundary
Interstate/Highway
City Boundary
Railroad
TRUCK TRAVEL TIME INDEX
UNINTERRUPTED (SEGMENTS 90-4, 80-7, 80-9)
GOOD (<1.15)
FAIR (1.15 - 1.33)
POOR (>1.33)
INTERRUPTED (SEGMENTS 90-1, 90-2, 90-3 90-5, 90-6, 80-8, 80-10)
GOOD (<1.3)
FAIR (1.3 - 2.0)
POOR (>2.0)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Segment 80-8
MP 350
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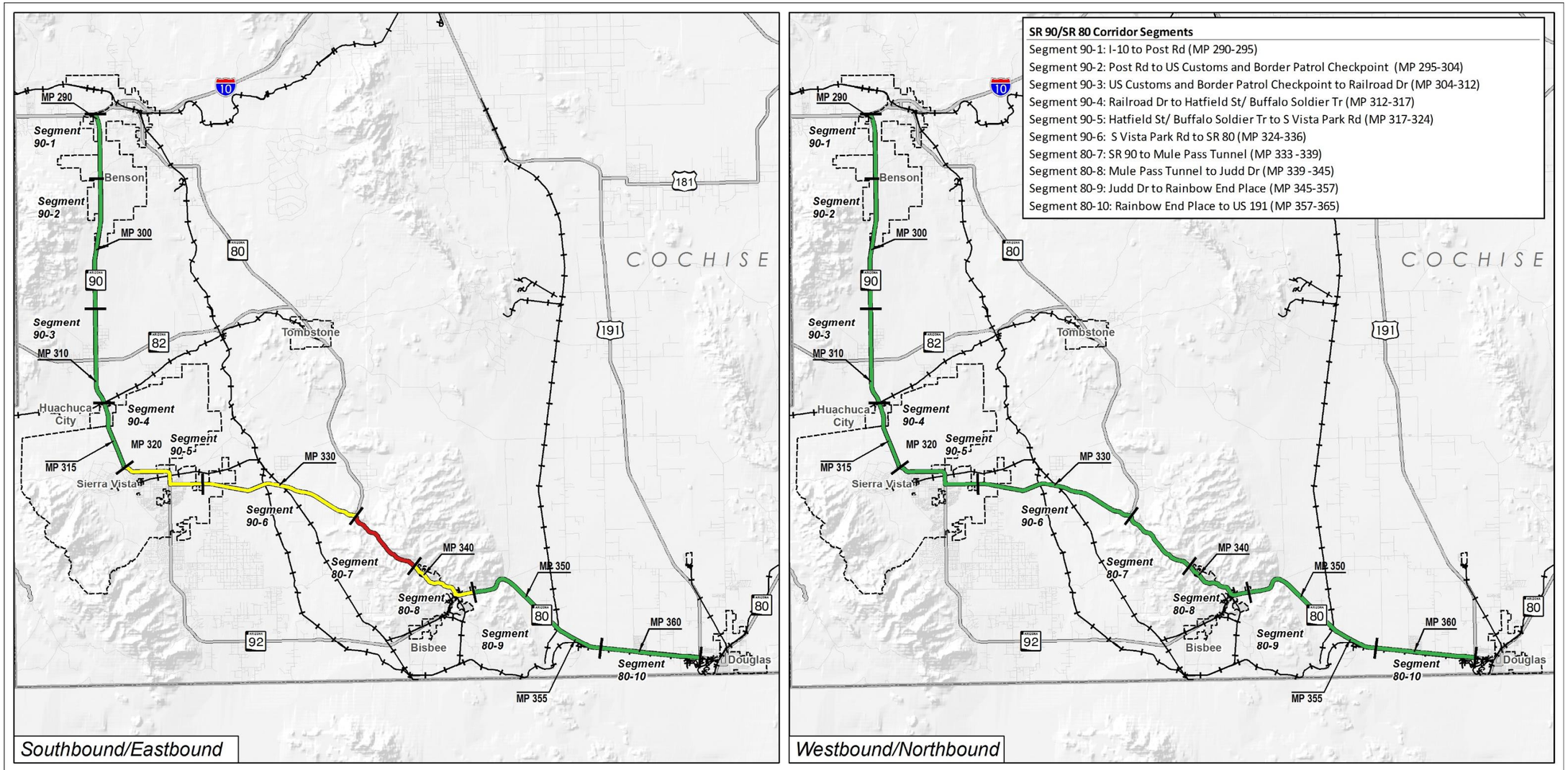
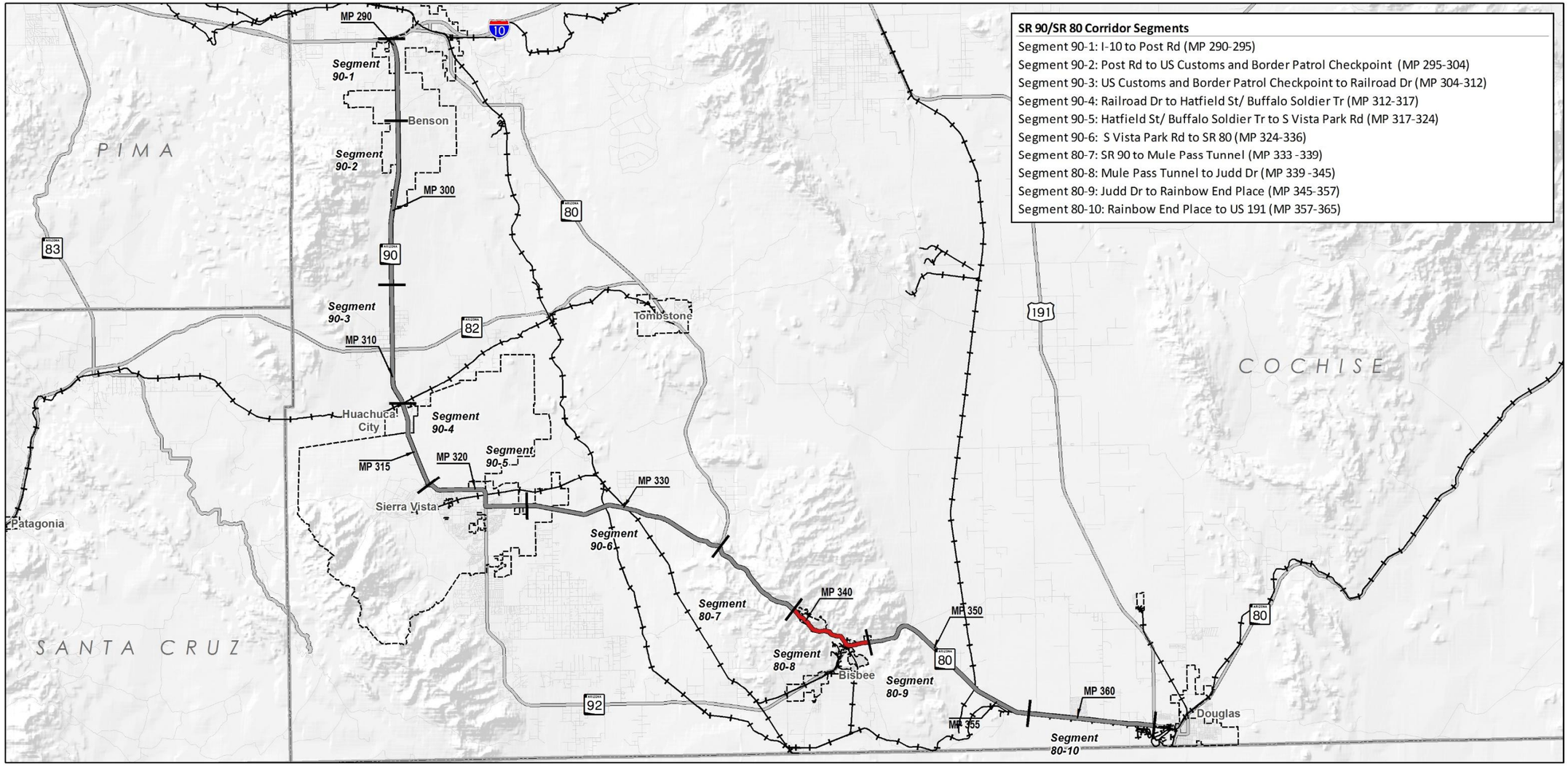
MP 360
Segment 80-10
Bisbee
Douglas
Southbound/Eastbound
Westbound/Northbound
N
Miles
0 5 10
SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Truck Planning Time Index
2015 Data
Corridor Segment
County Boundary
Interstate/Highway
City Boundary
Railroad
TRUCK PLANNING TIME INDEX
UNINTERRUPTED (SEGMENTS 90-4, 80-7, 80-9)
GOOD (<1.3)
FAIR (1.3 - 1.5)
POOR (>1.5)
INTERRUPTED (SEGMENTS 90-1, 90-2, 90-3 90-5, 90-6, 80-8, 80-10)
GOOD (<3.0)
FAIR (3.0 - 6.0)
POOR (>6.0)



SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Average Minutes Per Year Given Milepost Is Closed Per Segment Mile
2011 - 2015 Data

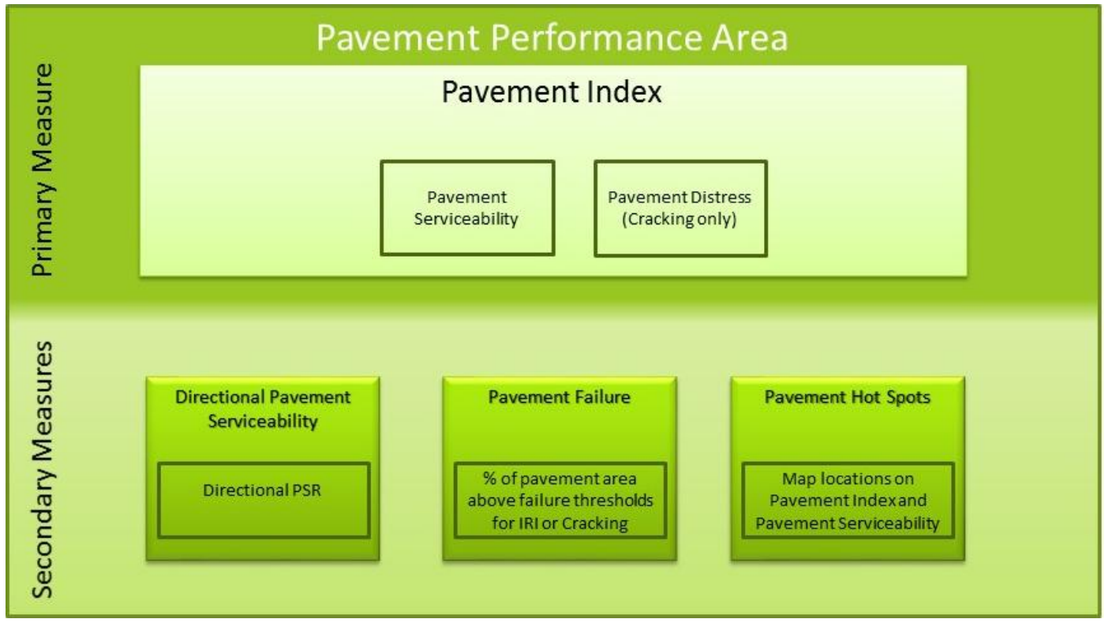


SR 90/SR 80 Corridor Profile Study: I 10 to US 191
Bridge Vertical Clearance
2016 Data

Appendix B: Performance Area Detailed Calculation Methodologies

Pavement Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Pavement performance area as shown in the following graphic:



This performance area is used to evaluate mainline pavement condition. Pavement condition data for ramps, frontage roads, crossroads, etc. was not included in the evaluation.

Primary Pavement Index

The Pavement Index is calculated based on the use of two pavement condition ratings from the ADOT Pavement Database. The two ratings are the International Roughness Index (IRI) and the Cracking rating. The calculation of the Pavement Index uses a combination of these two ratings.

The IRI is a measurement of the pavement roughness based on field-measured longitudinal roadway profiles. To facilitate the calculation of the index, the IRI rating was converted to a Pavement Serviceability Rating (PSR) using the following equation:

$$PSR = 5 * e^{-0.0038*IRI}$$

The Cracking Rating is a measurement of the amount of surface cracking based on a field-measured area of 1,000 square feet that serves as a sample for each mile. To facilitate the calculation of the index, the Cracking Rating was converted to a Pavement Distress Index (PDI) using the following equation:

$$PDI = 5 - (0.345 * C^{0.66})$$

Both the PSR and PDI use a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest performance. The performance thresholds for interstates and non-interstates shown in the tables below were used for the PSR and PDI.

Performance Level for Interstates	IRI (PSR)	Cracking (PDI)
Good	<75 (>3.75)	<7 (>3.75)
Fair	75 - 117 (3.20 - 3.75)	7 - 12 (3.22 - 3.75)
Poor	>117 (<3.20)	>12 (<3.22)

Performance Level for Non-Interstates	IRI (PSR)	Cracking (PDI)
Good	<94 (>3.5)	<9 (>3.5)
Fair	94 - 142 (2.9 - 3.5)	9 - 15 (2.9 - 3.5)
Poor	>142 (<2.9)	>15 (<2.9)

The PSR and PDI are calculated for each 1-mile section of roadway. If PSR or PDI falls into a poor rating (<3.2 for interstates, for example) for a 1-mile section, then the score for that 1-mile section is entirely (100%) based on the lower score (either PSR or PDI). If neither PSR or PDI fall into a poor rating for a 1-mile section, then the score for that 1-mile section is based on a combination of the lower rating (70% weight) and the higher rating (30% weight). The result is a score between 0 and 5 for each direction of travel of each mile of roadway based on a combination of both the PSR and the PDI.

The project corridor has been divided into segments. The Pavement Index for each segment is a weighted average of the directional ratings based on the number of travel lanes. Therefore, the condition of a section with more travel lanes will have a greater influence on the resulting segment Pavement Index than a section with fewer travel lanes.

Secondary Pavement Measures

Three secondary measures are evaluated:

- Directional Pavement Serviceability
- Pavement Failure
- Pavement Hot Spots

Directional Pavement Serviceability: Similar to the Pavement Index, the Directional Pavement Serviceability is calculated as a weighted average (based on number of lanes) for each segment. However, this rating only utilizes the PSR and is calculated separately for each direction of travel. The PSR uses a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest performance.

Pavement Failure: The percentage of pavement area rated above the failure thresholds for IRI or Cracking is calculated for each segment. In addition, the Standard score (z-score) is calculated for each segment.

The Standard score (z-score) is the number of standard deviations above or below the mean. Therefore, a Standard score between -0.5 and +0.5 is “average”, less than -0.5 is lower (better) than average, and higher than +0.5 is above (worse) than average.

Pavement Hot Spots: The Pavement Index map identifies locations that have an IRI rating or Cracking rating that fall above the failure threshold as identified by ADOT Pavement Group. For interstates, an IRI rating above 105 or a Cracking rating above 15 will be used as the thresholds which are slightly different than the ratings shown previously. For non-interstates, an IRI rating above 142 or a Cracking rating above 15 will be used as the thresholds.

Scoring

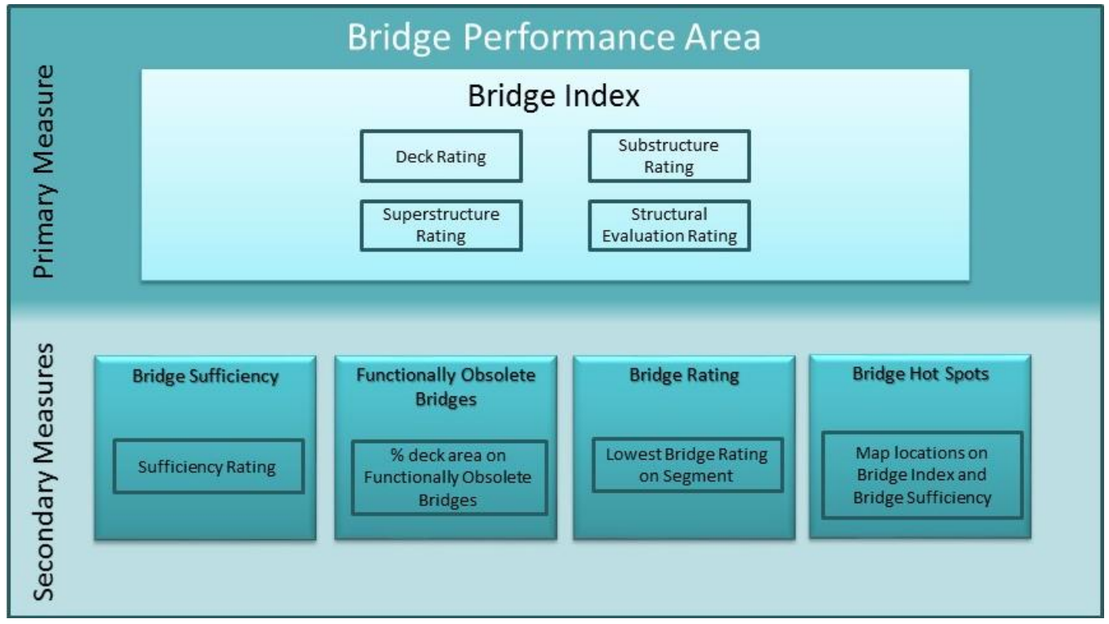
Performance Level	Pavement Index	
	Interstates	Non-Interstates
Good	>3.75	>3.5
Fair	3.2 - 3.75	2.9 - 3.5
Poor	<3.2	<2.9

Performance Level	Directional Pavement Serviceability	
	Interstates	Non-Interstates
Good	>3.75	>3.5
Fair	3.2 - 3.75	2.9 - 3.5
Poor	<3.2	<2.9

Performance Level	% Pavement Failure
Good	< 5%
Fair	5% – 20%
Poor	>20%

Bridge Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Bridge performance area as shown in the following graphic:



This performance area is used to evaluate mainline bridges. Bridges on ramps (that do not cross the mainline), frontage roads, etc. should not be included in the evaluation. Basically, any bridge that carries mainline traffic or carries traffic over the mainline should be included and bridges that do not carry mainline traffic, run parallel to the mainline (frontage roads), or do not cross the mainline should not be included.

Primary Bridge Index

The Bridge Index is calculated based on the use of four bridge condition ratings from the ADOT Bridge Database, also known as the Arizona Bridge Information and Storage System (ABISS). The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating. The calculation of the Bridge Index uses the lowest of these four ratings.

Each of the four condition ratings use a 0 to 9 scale with 0 representing the lowest performance and 9 representing the highest performance.

The project corridor has been divided into segments and the bridges are grouped together according to the segment definitions. In order to report the Bridge Index for each corridor segment, the Bridge Index for each segment is a weighted average based on the deck area for each bridge. Therefore, the condition of a larger bridge will have a greater influence on the resulting segment Bridge Index than a smaller bridge.

Secondary Bridge Measures

Four secondary measures will be evaluated:

- Bridge Sufficiency
- Functionally Obsolete Bridges
- Bridge Rating
- Bridge Hot Spots

Bridge Sufficiency: Similar to the Bridge Index, the Bridge Sufficiency rating is calculated as a weighted average (based on deck area) for each segment. The Bridge Sufficiency rating is a scale of 0 to 100 with 0 representing the lowest performance and 100 representing the highest performance. A rating of 80 or above represents “good” performance, a rating between 50 and 80 represents “fair” performance, and a rating below 50 represents “poor” performance.

Functionally Obsolete Bridges: The percentage of total deck area in a segment that is on functionally obsolete bridges is calculated for each segment. The deck area for each bridge within each segment that has been identified as functionally obsolete is totaled and divided by the total deck area for the segment to calculate the percentage of deck area on functionally obsolete bridges for each segment.

The thresholds for this performance measure are determined based on the Standard score (z-score). The Standard score (z-score) is the number of standard deviations above or below the mean. Therefore, a Standard score between -0.5 and +0.5 is “average”, less than -0.5 is lower (better) than average, and higher than +0.5 is above (worse) average.

Bridge Rating: The Bridge Rating simply identifies the lowest bridge rating on each segment. This performance measure is not an average and therefore is not weighted based on the deck area. The Bridge Index identifies the lowest rating for each bridge, as described above. Each of the four condition ratings use a 0 to 9 scale with 0 representing the lowest performance and 9 representing the highest performance.

Bridge Hot Spots: The Bridge Index map identifies individual bridge locations that are identified as hot spots. Hot spots are bridges that have a single rating of 4 in any of the four ratings, or multiple ratings of 5 in the deck, substructure or superstructure ratings.

Scoring:

Performance Level	Bridge Index
Good	>6.5
Fair	5.0-6.5
Poor	<5.0

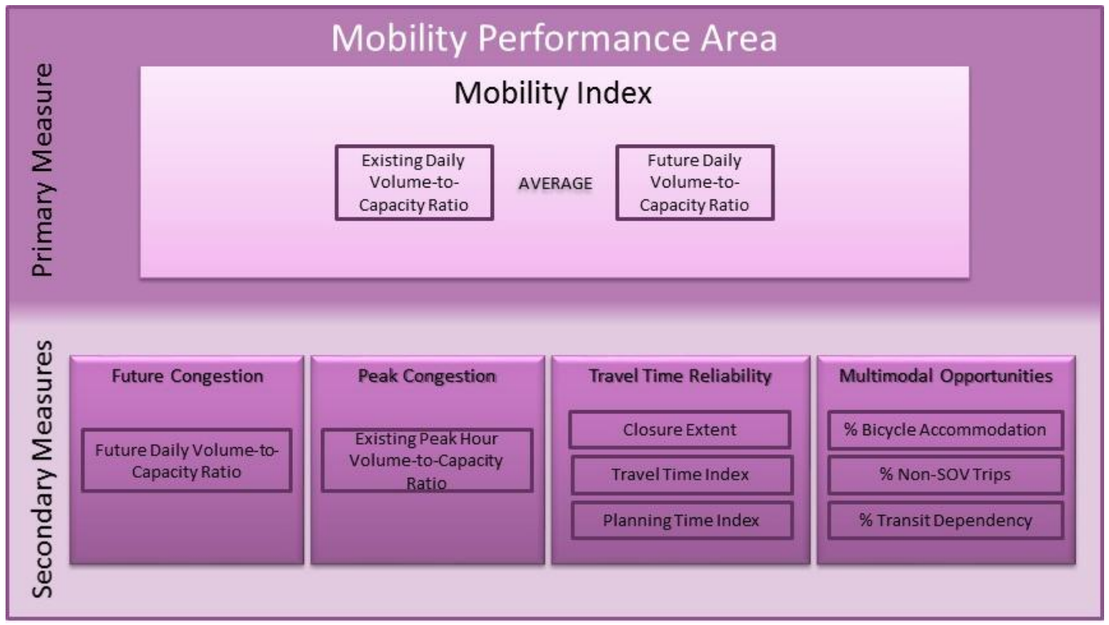
Performance Level	Sufficiency Rating
Good	>80
Fair	50-80
Poor	<50

Performance Level	Bridge Rating
Good	>6
Fair	5-6
Poor	<5

Performance Level	% Functionally Obsolete
Good	< 12%
Fair	12%-40%
Poor	>40%

Mobility Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Mobility performance area as shown in the following graphic:



Primary Mobility Index

The primary Mobility Index is an average of the existing daily volume-to-capacity (V/C) ratio and the future daily V/C ratio for each segment of the corridor.

Existing Daily V/C: The existing daily V/C ratio for each segment is calculated by dividing the 2014 Annual Average Daily Traffic (AADT) volume for each segment by the total Level of Service (LOS) E capacity volume for that segment

The capacity is calculated using the HERS Procedures for Estimating Highway Capacity[1]. The HERS procedure incorporates HCM 2010 methodologies. The methodology includes capacity estimation procedures for multiple facility types including freeways, rural two-lane highways, multilane highways, and signalized and non-signalized urban sections.

The segment capacity is defined as a function of the number of mainline lanes, shoulder width, interrupted or uninterrupted flow facilities, terrain type, percent of truck traffic, and the designated urban or rural environment.

The AADT for each segment is calculated by applying a weighted average across the length of the segment based on the individual 24-hour volumes and distances associated with each HPMS count station within each segment.

The following example equation is used to determine the weighted average of a segment with two HPMS count locations within the corridor

((HPMS 1 Distance x HPMS 1 Volume) + (HPMS 2 Distance x HPMS 2 Volume))/Total Segment Length

For specific details regarding the HERS methodology used, refer to the *Procedures for Estimating Highway Capacity, draft Technical Memorandum.*

Future Daily V/C: The future daily V/C ratio for each segment is calculated by dividing the 2035 AADT volume for each segment by the 2014 LOS E capacity. The capacity volume used in this calculation is the same as is utilized in the existing daily V/C equation.

The future AADT daily volumes are generated by applying an average annual compound growth rate (ACGR) to each 2014 AADT segment volume. The following equation is used to apply the average annual compound growth rate:

2035 AADT = 2014 AADT x ((1+ACGR)^(2035-2014))

The ACGR for each segment is defined by comparing the total volumes in the 2010 Arizona Travel Demand Model (AZTDM2) to the 2035 AZTDM2 traffic volumes at each existing HPMS count station location throughout the corridor. Each 2010 and 2035 segment volume is defined using the same weighted average equation described in the *Existing Daily V/*C section above and then summing the directional volumes for each location. The following equation is used to determine the ACGR for each segment:

ACGR = ((2035 Volume/2010 Volume)^(1/(2035-2010))))-1

Secondary Mobility Measures

Four secondary measures are evaluated:

- Future Congestion
- Peak Congestion
- Travel Time Reliability

[1] HERS Support – 2011, Task 6: Procedures for Estimating Highway Capacity, draft Technical Memorandum. Cambridge Systematics. Prepared for the Federal Highway Administration. March 2013.

- Closure Extent
- Directional Travel Time Index
- Directional Planning Time Index

- Multimodal Opportunities
  - % Bicycle Accommodation
  - % Non-Single Occupancy Vehicle (SOV) Trips
  - % Transit Dependency

Future Congestion: The future daily V/C ratios for each segment in the corridor that are calculated and used in the Mobility Index as part of the overall average between Existing Daily V/C and Future Daily V/C are applied independently as a secondary measure. The methods to calculate the Future Daily V/C can be referenced in the Mobility Index section.

Peak Congestion: Peak Congestion has been defined as the peak hour V/C ratio in both directions of the corridor. The peak hour V/C ratio is calculated using the HERS method as described previously. The peak hour volume utilizes the directional AADT for each segment, which is calculated by applying a weighted average across the length of the segment based on the individual directional 24-hour volumes and distances associated with each HPMS count station within each segment. The segment capacity is defined based on the characteristics of each segment including number of lanes, terrain type, and environment, similar to the 24-hour volumes using the HERS method.

Travel Time Reliability: Travel time reliability is a secondary measure that includes three indicators. The three indicators are the number of times a piece of a corridor is closed for any specific reason, the directional Travel Time Index (TTI), and the directional Planning Time Index (PTI).

Closure Extent: The number of times a roadway is closed is documented through the HCRS dataset. Closure Extent is defined as the average number of times a particular milepost of the corridor is closed per year per mile in a specific direction of travel. The weighted average of each occurrence takes into account the distance over which a specific occurrence spans.

Thresholds that determine levels of good, fair, and poor are based on the average number of closures per mile per year within each of the identified statewide significant corridors by ADOT. The thresholds shown at the end of this section represent statewide averages across those corridors.

Directional Travel Time and Planning Time Index: In terms of overall mobility, the TTI is the relationship of the mean peak period travel time in a specific section of the corridor to the free-flow travel time in the same location. The PTI is the relationship of the 95th percentile highest travel time to the free-flow travel time (based on the posted speed limit) in a specific section of the corridor. The TTI and PTI can be converted into speed-based indices by recognizing that speed is equal to distance traveled divided by travel time. The inverse relationship between travel time and speed means that the 95th percentile highest travel time corresponds to the 5th percentile lowest speed.

Using HERE data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak). Using the mean speeds and 5th percentile lowest mean speeds collected over 2014 for these time periods for each data location, four TTI and PTI calculations were made using the following formulas:

TTI = Posted Speed Limit/Mean Peak Hour Speed

PTI = Posted Speed Limit/5th Percentile Lowest Speed

The highest value of the four time periods calculation is defined as the TTI for that data point. The average TTI is calculated within each segment based on the number of data points collected. The value of the average TTI across each entry is used as the TTI for each respective segment within the corridor.

Multimodal Opportunities: Three multimodal opportunity indicators reflect the characteristics of the corridor that promote alternate modes to a single occupancy vehicle (SOV) for trips along the corridor. The three indicators include the percent bicycle accommodation, non-SOV trips, and transit dependency along the corridor.

Percent Bicycle Accommodation: For this secondary performance evaluation, outside shoulder widths are evaluated considering the roadway's context and conditions. This requires use of the roadway data that includes right shoulder widths, shoulder surface types, and speed limits, all of which are available in the following ADOT geographic information system (GIS) data sets:

- Right Shoulder Widths
- Left Shoulder Widths (for undivided roadways)
- Shoulder Surface Type (Both Left/Right)
- Speed Limit

Additionally, each segment's average AADT, estimated earlier in the Mobility performance area methodology, is used for the criteria to determine if the existing shoulder width meets the effective width.

The criteria for screening if a shoulder segment meets the recommended width criteria are as followed:

(1) If AADT <= 1500 OR Speed Limit <= 25 miles per hour (mph):
The segment's general purpose lane can be shared with bicyclists (no effective shoulder width required)

(2) If AADT > 1500 AND Speed Limit between (25 - 50 mph) AND Pavement Surface is Paved:
Effective shoulder width required is 4 feet or greater

(3) If AADT > 1500 AND Speed Limit >= 50 mph and Pavement Surface is Paved:
Effective shoulder width required is 6 feet or greater

The summation of the length of the shoulder sections that meet the defined effective width criteria, based on criteria above, is divided by the segment's total length to estimate the percent of the segment that accommodates bicycles as illustrated at the end of this section. If shoulder data is not available or appears erroneous, field measurements can substitute for the shoulder data.

Percent Non-SOV Trips: The percentage of non-SOV trips over distances less than 50 miles gives an indication of travel patterns along a section of the corridor that could benefit from additional multimodal options in the future.

Thresholds that determine levels of good, fair, and poor are based on the percent non-SOV trips within each of the identified statewide significant corridors by ADOT. The thresholds shown at the end of this section represent statewide averages across those corridors.

Percent Transit Dependency: 2008-2012 U.S. Census American Community Survey tract and state level geographic data and attributes from the tables B08201 (Number of Vehicles Available by Household Size) and B17001 (Population in Poverty within the Last 12 Months) were downloaded with margins of error included from the Census data retrieval application Data Ferret. Population ranges for each tract were determined by adding and subtracting the margin of error to each estimate in excel. The tract level attribute data was then joined to geographic tract data in GIS. Only tracts within a one mile buffer of each corridor are considered for this evaluation.

Tracts that have a statistically significantly larger number of either people in poverty or households with only one or no vehicles available than the state average are considered potentially transit dependent.

Example: The state average for zero or one vehicles households (HHs) is between 44.1% and 45.0%. Tracts which have the lower bound of their range above the upper bound of the state range have a greater percentage of zero/one vehicle HHs than the state average. Tracts that have their upper bound beneath the lower bound of the state range have a lesser percentage of zero/one vehicles HHs than the state average. All other tracts that have one of their bounds overlapping with the state average cannot be considered statistically significantly different because there is a chance the value is actually the same.

In addition to transit dependency, the following attributes are added to the Multimodal Opportunities map based on available data.

- Shoulder width throughout the corridor based on 'Shoulder Width' GIS dataset provided by ADOT
- Intercity bus routes
- Multiuse paths within the corridor right-of-way, if applicable

Scoring:

Volume-to-Capacity Ratios		
Urban and Fringe Urban		
Good - LOS A-C	V/C ≤ 0.71	*Note - ADOT Roadway Design Standards indicate Urban and Fringe Urban roadways should be designed to level of service C or better
Fair - LOS D	V/C > 0.71 & ≤ 0.89	
Poor - LOS E or less	V/C > 0.89	
Rural		
Good - LOS A-B	V/C ≤ 0.56	*Note - ADOT Roadway Design Standards indicate Rural roadways should be designed to level of service B or better
Fair - LOS C	V/C > 0.56 & ≤ 0.76	
Poor - LOS D or less	V/C > 0.76	

Performance Level	Closure Extent
Good	≤ 0.22
Fair	> 0.22 & ≤ 0.62
Poor	V/C > 0.62

Performance Level	TTI on Uninterrupted Flow Facilities
Good	< 1.15
Fair	≥ 1.15 & < 1.33
Poor	≥ 1.33

Performance Level	TTI on Interrupted Flow Facilities
Good	< 1.30
Fair	≥ 1.30 & < 1.2.00
Poor	≥ 2.00

Performance Level	PTI on Uninterrupted Flow Facilities
Good	< 1.30
Fair	≥ 1.30 & < 1.50
Poor	≥ 1.50

Performance Level	PTI Interrupted Flow Facilities
Good	< 3.00
Fair	≥ 3.00 & < 6.00
Poor	≥ 6.00

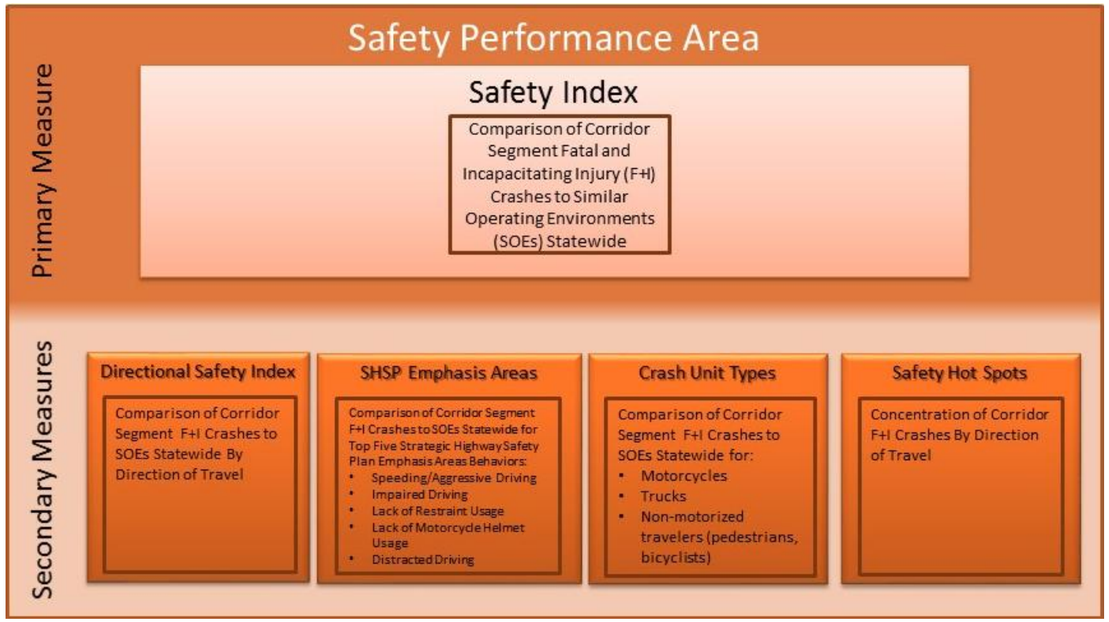
Performance Level	Percent Bicycle Accommodation
Good	≥ 90%
Fair	> 60% & ≤ 90%
Poor	< 60%

Performance Level	Percent Non-SOV Trips
Good	≥ 17%
Fair	> 11% & ≤ 17%
Poor	< 11%

Performance Level	Percent Transit Dependency
Good	Tracts with both zero and one vehicle household population in poverty percentages below the statewide average
Fair	Tracts with either zero and one vehicle household or population in poverty percentages below the statewide average
Poor	Tracts with both zero and one vehicle household and population in poverty percentages above the statewide average

Safety Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Safety performance area as shown in the following graphic:



Primary Safety Index

The Safety Index is a safety performance measure based on the bi-directional (i.e., both directions combined) frequency and rate of fatal and incapacitating injury crashes, the relative cost of those types of crashes, and crash occurrences on similar roadways in Arizona. According to ADOT's 2010 Highway Safety Improvement Program Manual, fatal crashes have an estimated cost that is 14.5 times the estimated cost of incapacitating injury crashes ($5.8 million compared to $400,000).

The Combined Safety Score (CSS) is an interim measure that combines fatal and incapacitating injury crashes into a single value. The CSS is calculated using the following generalized formula:

*CSS = 14.5 * (Normalized Fatal Crash Rate + Frequency) + (Normalized Incapacitating Injury Crash Rate + Frequency)*

Because crashes vary depending on the operating environment of a particular roadway, statewide CSS values were developed for similar operating environments defined by functional classification, urban vs. rural setting, number of travel lanes, and traffic volumes. To determine the Safety Index of a particular segment, the segment CSS is compared to the average statewide CSS for the similar statewide operating environment.

The Safety Index is calculated using the following formula:

Safety Index = Segment CSS / Statewide Similar Operating Environment CSS

The average annual Safety Index for a segment is compared to the statewide similar operating environment annual average, with one standard deviation from the statewide average forming the scale break points.

The more a particular segment's Safety Index value is below the statewide similar operating environment average, the better the safety performance is for that particular segment as a lower value represents fewer crashes.

Scoring:

The scale for rating the Safety Index depends on the operating environments selected, as shown in the table below.

Similar Operating Environment	Safety Index (Overall & Directional)	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	0.94	1.06
2 or 3 or 4 Lane Divided Highway	0.77	1.23
4 or 5 Lane Undivided Highway	0.80	1.20
6 Lane Highway	0.56	1.44
Rural 4 Lane Freeway with Daily Volume < 25,000	0.73	1.27
Rural 4 Lane Freeway with Daily Volume > 25,000	0.68	1.32
Urban 4 Lane Freeway	0.79	1.21
Urban or Rural 6 Lane Freeway	0.82	1.18
Urban > 6 Lane Freeway	0.80	1.20

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Some corridor segments may have a very low number of total fatal and incapacitating injury crashes. Low crash frequencies (i.e., a small sample size) can translate into performance ratings that can be unstable. In some cases, a change in crash frequency of one crash (one additional crash or one less crash) could result in a change in segment performance of two levels. To avoid reliance on performance ratings where small changes in crash frequency result in large changes in performance, the following two criteria were developed to identify segments with "insufficient data" for assessing performance for the Safety Index. Both of these criteria must be met for a segment to have "insufficient data" to reliably rate the Safety Index performance:

- If the crash sample size (total fatal plus incapacitating injury crashes) for a given segment is less than five crashes over the five-year analysis period; AND

- If a change in one crash results in a ~~change~~ improvement in segment performance by two levels (i.e., a change from below average to above average performance ~~or a change from above average to below average frequency~~), the segment has "insufficient data" and Safety Index performance ratings are unreliable.

Secondary Safety Measures

The Safety performance area has four secondary measures related to fatal and incapacitating injury crashes:

- Directional Safety Index
- Strategic Highway Safety Plan (SHSP) Behavior Emphasis Areas
- Crash Unit Types
- Safety Hot Spots

Directional Safety Index: The Direction Safety Index shares the same calculation procedure and thresholds as the Safety Index. However, the measure is based on the directional frequency and rate of fatal and incapacitating injury crashes.

Similar to the Safety Index, the segment CSS is compared to the average statewide CSS for the similar statewide operating environment. The Directional Safety Index follows the lead of the Safety Index in terms of "insufficient data" status. If the Safety Index meets both criteria for "insufficient data", the Directional Safety Index should also be changed to "insufficient data". If the Safety Index does not meet both criteria for "insufficient data", the Directional Safety Index would also not change to say "insufficient data"

SHSP Behavior Emphasis Areas: ADOT's 2014 SHSP identifies several emphasis areas for reducing fatal and incapacitating injury crashes. The top five SHSP emphasis areas relate to the following driver behaviors:

- Speeding and aggressive driving
- Impaired driving
- Lack of restraint usage
- Lack of motorcycle helmet usage
- Distracted driving

To develop a performance measure that reflects these five emphasis areas, the percentage of total fatal and incapacitating injury crashes that involves at least one of the emphasis area driver behaviors on a particular segment is compared to the statewide average percentage of crashes involving at least one of the emphasis area driver behaviors on roads with similar operating environments in a process similar to how the Safety Index is developed.

To increase the crash sample size for this performance measure, the five behavior emphasis areas are combined to identify fatal and incapacitating injury crashes that exhibit one or more of the behavior emphasis areas.

The SHSP behavior emphasis areas performance is calculated using the following formula:

% Crashes Involving SHSP Behavior Emphasis Areas = Segment Crashes Involving SHSP Behavior Emphasis Areas / Total Segment Crashes

The percentage of total crashes involving SHSP behavior emphasis areas for a segment is compared to the statewide percentages on roads with similar operating environments. One standard deviation from the statewide average percentage forms the scale break points.

When assessing the performance of the SHSP behavior emphasis areas, the more the frequency of crashes involving SHSP behavior emphasis areas is below the statewide average implies better levels of segment performance. Thus, lower values are better, similar to the Safety Index.

Scoring:

The scale for rating the SHSP behavior emphasis areas performance depends on the crash history on similar statewide operating environments, as shown in the table below:

Similar Operating Environment	Crashes in SHSP Top 5 Emphasis Areas	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	51.2%	57.5%
2 or 3 or 4 Lane Divided Highway	44.4%	54.4%
4 or 5 Lane Undivided Highway	42.4%	51.1%
6 Lane Highway	35.3%	46.5%
Rural 4 Lane Freeway with Daily Volume < 25,000	42.8%	52.9%
Rural 4 Lane Freeway with Daily Volume > 25,000	40.8%	57.1%
Urban 4 Lane Freeway	49.1%	59.4%
Urban or Rural 6 Lane Freeway	33.5%	57.2%
Urban > 6 Lane Freeway	42.6%	54.8%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

The SHSP behavior emphasis areas secondary safety performance measure for the Safety performance area includes proportions of specific types of crashes within the total fatal and incapacitating injury crash frequencies. This more detailed categorization of fatal and incapacitating injury crashes can result in low crash frequencies (i.e., a small sample size) that translate into performance ratings that can be unstable. In some cases, a change in crash frequency of one crash (one additional crash or one less crash) could result in a change in segment performance of two levels. To avoid reliance on performance ratings where small changes in crash frequency result in large changes in performance, the following criteria were developed to identify segments with "insufficient data" for assessing performance for the SHSP behavior emphasis areas secondary

safety performance measure. If any of these criteria are met for a segment, that segment has "insufficient data" to reliably rate the SHSP behavior emphasis areas performance:

- If the crash sample size (total fatal plus incapacitating injury crashes) for a given segment is less than five crashes over the five-year analysis period, the segment has "insufficient data" and performance ratings are unreliable. OR
- If a change in one crash results in a change in segment performance by two levels (i.e., a change from below average to above average performance or a change from above average to below average frequency), the segment has "insufficient data" and performance ratings are unreliable. OR
- If the corridor average segment crash frequency for the SHSP behavior emphasis areas performance measure is less than two crashes over the five-year analysis period, the entire SHSP behavior emphasis areas performance measure has "insufficient data" and performance ratings are unreliable.

Crash Unit Type Emphasis Areas: ADOT's SHSP also identifies emphasis areas that relate to the following "unit-involved" crashes:

- Heavy vehicle (trucks)-involved crashes
- Motorcycle-involved crashes
- Non-motorized traveler (pedestrians and bicyclists)-involved crashes

To develop a performance measure that reflects the aforementioned crash unit type emphasis areas, the percentage of total fatal and incapacitating injury crashes that involves a given crash unit type emphasis area on a particular segment is compared to the statewide average percentage of crashes involving that same crash unit type emphasis area on roads with similar operating environments in a process similar to how the Safety Index is developed.

The SHSP crash unit type emphasis areas performance is calculated using the following formula:

% Crashes Involving Crash Unit Type = Segment Crashes Involving Crash Unit Type / Total Segment Crashes

The percentage of total crashes involving crash unit types for a segment is compared to the statewide percentages on roads with similar operating environments. One standard deviation from the statewide average percentage forms the scale break points.

When assessing the performance of the crash unit types, the more the frequency of crashes involving crash unit types is below the statewide average implies better levels of segment performance. Thus, lower values are better, similar to the Safety Index. The scale for rating the unit-involved crash performance depends on the crash history on similar statewide operating environments, as shown in the following tables.

Scoring:

Similar Operating Environment	Crashes Involving Trucks	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	5.2%	7.1%
2 or 3 or 4 Lane Divided Highway	3.5%	7.3%
4 or 5 Lane Undivided Highway	6.1%	9.6%
6 Lane Highway	0.3%	8.7%
Rural 4 Lane Freeway with Daily Volume < 25,000	13.2%	17.0%
Rural 4 Lane Freeway with Daily Volume > 25,000	7.2%	12.9%
Urban 4 Lane Freeway	6.8%	10.9%
Urban or Rural 6 Lane Freeway	6.2%	11.0%
Urban > 6 Lane Freeway	2.5%	6.0%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Motorcycles	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	18.5%	26.5%
2 or 3 or 4 Lane Divided Highway	16.3%	26.3%
4 or 5 Lane Undivided Highway	6.4%	9.4%
6 Lane Highway	0.0%	20.0%
Rural 4 Lane Freeway with Daily Volume < 25,000	5.0%	8.5%
Rural 4 Lane Freeway with Daily Volume > 25,000	7.7%	17.1%
Urban 4 Lane Freeway	9.3%	11.5%
Urban or Rural 6 Lane Freeway	6.7%	12.9%
Urban > 6 Lane Freeway	12.6%	20.5%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Non-Motorized Travelers	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	2.2%	4.2%
2 or 3 or 4 Lane Divided Highway	2.4%	4.5%
4 or 5 Lane Undivided Highway	4.7%	7.9%
6 Lane Highway	8.4%	17.4%
Rural 4 Lane Freeway with Daily Volume < 25,000	1.7%	2.5%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.0%	0.0%
Urban 4 Lane Freeway	4.8%	10.3%
Urban or Rural 6 Lane Freeway	0.9%	6.7%
Urban > 6 Lane Freeway	0.5%	1.5%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

The crash unit types have the same "insufficient data" criteria as the SHSP behavior emphasis areas.

Safety Hot Spots: A hot spot analysis was conducted that identified abnormally high concentrations of fatal and incapacitating injury crashes along the study corridor by direction of travel. The identification of crash concentrations involves a GIS-based function known as "kernel density analysis". This measure is mapped for graphical display purposes with the Directional Safety Index but is not included in the Safety performance area rating calculations.

Freight Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Freight performance area as shown in the following graphic:

Primary Freight Index

The Freight Index is a reliability performance measure based on the planning time index for truck travel. The industry standard definition for the Truck Planning Time Index (TPTI) is the ratio of total travel time needed for 95% on-time arrival to free-flow travel time. The TPTI reflects the extra buffer time needed for on-time delivery while accounting for non-recurring delay. Non-recurring delay refers to unexpected or abnormal delay due to closures or restrictions resulting from circumstances such as crashes, inclement weather, and construction activities.

The TPTI can be converted into a speed-based index by recognizing that speed is equal to distance traveled divided by travel time. The inverse relationship between travel time and speed means that the 95th percentile highest travel time corresponds to the 5th percentile lowest speed. The speed-based TPTI is calculated using the following formula:

TPTI = Free-Flow Truck Speed / Observed 5th Percentile Lowest Truck Speed

Observed 5th percentile lowest truck speeds are available in the 2014 American Digital Cartography, Inc. HERE (formerly NAVTEQ) database to which ADOT has access. The free-flow truck speed is assumed to be 65 miles per hour or the posted speed, whichever is less. This upper limit of 65 mph accounts for governors that trucks often have that restrict truck speeds to no more than 65 mph, even when the speed limit may be higher.

For each corridor segment, the TPTI is calculated for each direction of travel and then averaged to create a bi-directional TPTI. When assessing performance using TPTI, the higher the TPTI value is above 1.0, the more buffer time is needed to ensure on-time delivery.

The Freight Index is calculated using the following formula to invert the overall TPTI:

Freight Index = 1 / Bi-directional TPTI

Inversion of the TPTI allows the Freight Index to have a scale where the higher the value, the better the performance, which is similar to the directionality of the scales of most of the other primary measures. This Freight Index scale is based on inverted versions of TPTI scales created previously by ADOT. The scale for rating the Freight Index differs between uninterrupted and interrupted flow facilities.

Secondary Freight Measures

The Freight performance area includes five secondary measures that provide an in-depth evaluation of the different characteristics of freight performance:

- Recurring Delay (Directional TTTI)
- Non-Recurring Delay (Directional TPTI)
- Closure Duration
- Bridge Vertical Clearance
- Bridge Vertical Clearance Hot Spots

Recurring Delay (Directional TTTI): The performance measure for recurring delay is the Directional Truck Travel Time Index (TTTI). The industry standard definition for TTTI is the ratio of average peak period travel time to free-flow travel time. The TTTI reflects the extra time spent in traffic during peak times due to recurring delay. Recurring delay refers to expected or normal delay due to roadway capacity constraints or traffic control devices.

Similar to the TPTI, the TTTI can be converted into a speed-based index by recognizing that speed is equal to distance traveled divided by travel time. The speed-based TTTI can be calculated using the following formula:

TTTI = Free-Flow Truck Speed / Observed Average Peak Period Truck Speed

Observed average peak period truck speeds are available in the 2014 American Digital Cartography, Inc. HERE (formerly NAVTEQ) database to which ADOT has access. The free-flow truck speed is assumed to be 65 mph or the posted speed, whichever is less.

For each corridor segment, the TTTI is calculated for each direction of travel. With the TTTI, the higher the TTTI value is above 1.0, the more time is spent in traffic during peak times. TTTI values are generally lower than TPTI values. The Directional TTTI scale is based on TTTI scales created previously by ADOT.

Non-Recurring Delay (Directional TPTI): The performance measure for non-recurring delay is the Directional TPTI. Directional TPTI is calculated as described previously as an interim step in the development of the Freight Index.

For each corridor segment, the TPTI is calculated for each direction of travel. With the TPTI, the higher the TPTI value is above 1.0, the more buffer time is needed to ensure on-time delivery.

Closure Duration: This performance measure related to road closures is average roadway closure (i.e., full lane closure) duration time in minutes. There are three main components to full closures that affect reliability – frequency, duration, and extent. In the freight industry, closure duration is the most important component because trucks want to minimize travel time and delay.

Data on the frequency, duration, and extent of full roadway closures on the ADOT State Highway System is available for 2010-2014 in the HCRS database that is managed and updated by ADOT.

The average closure duration in a segment – in terms of the average time a milepost is closed per mile per year on a given segment – is calculated using the following formula:

*Closure Duration = Sum of Segment (Closure Clearance Time * Closure Extent) / Segment Length*

The segment closure duration time in minutes can then be compared to statewide averages for closure duration in minutes, with one-half standard deviation from the average forming the scale break points. The scale for rating closure duration in minutes is found at the end of this section.

Bridge Vertical Clearance: This performance measure uses the vertical clearance information from the ADOT Bridge Database to identify locations with low vertical clearance. The minimum vertical clearance for all underpass structures (i.e., structures under which mainline traffic passes) is determined for each segment.

Bridge Vertical Clearance Hot Spots: This performance measure related to truck restrictions is the locations, or hot spots, where bridge vertical clearance issues restrict truck travel. Sixteen feet three inches (16.25') is the minimum standard vertical clearance value for state highway bridges over travel lanes.

Locations with lower vertical clearance values than the minimum standard are categorized by the ADOT Intermodal Transportation Department Engineering Permits Section as either locations where ramps exist that allow the restriction to be avoided or locations where ramps do not exist and the restriction cannot be avoided. The locations with vertical clearances below the minimum standard that cannot be ramped around are considered hot spots. This measure is mapped for graphical display purposes with the bridge vertical clearance map but is not included in the Freight performance area rating calculations.

Scoring:

Performance Level	Freight Index	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	> 0.77	> 0.33
Fair	0.67 – 0.77	0.17 – 0.33
Poor	< 0.67	< 0.17

Performance Level	TTTI	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	< 1.15	< 1.30
Fair	1.15 – 1.33	1.30 – 2.00
Poor	> 1.33	> 2.00

Performance Level	TPTI	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	< 1.30	< 3.00
Fair	1.30 – 1.50	3.00 – 6.00
Poor	> 1.50	> 6.00

Performance Level	Closure Duration (minutes)
Good	< 44.18
Fair	44.18 – 124.86
Poor	> 124.86

Performance Level	Bridge Vertical Clearance
Good	> 16.5'
Fair	16.0' – 16.5'
Poor	< 16.0'

Appendix C: Performance Area Data

Pavement Performance Area Data

					Direction 1 (Southbound/Eastbound)			Direction 2 (Northbound/Westbound)			Direction 1 (Southbound/Eastbound)		Direction 2 (Northbound/Westbound)		Composite			% Pavement Failure	
					# of Lanes	IRI	Cracking	# of Lanes	IRI	Cracking	PSR	PDI	PSR	PDI	Dir 1 (SB/EB)	Dir 2 (NB/WB)	Pavement Index	Dir 1 (SB/EB)	Dir 2 (NB/WB)
Segment 1		*Interstate?*			No														
Milepost	290	to	291		2	97.64	1.00	2	62.69	4.00	3.45	4.7	3.94	4.1	3.81	4.00		0	0
Milepost	291	to	292		2	39.41	15.00	2	47.65	1.00	4.30	2.9	4.17	4.7	3.35	4.32		0	0
Milepost	292	to	293		2	33.34	4.00	2	44.02	0.00	4.41	4.1	4.23	5.0	4.22	4.46		0	0
Milepost	293	to	294		2	36.93	4.00	2	44.11	4.00	4.35	4.1	4.23	4.1	4.20	4.17		0	0
Milepost	294	to	295		2	39.44	4.00	2	42.37	3.00	4.30	4.1	4.26	4.3	4.19	4.27		0	0
				Total	10			10											0
				Weighted Average							4.16	4.00	4.17	4.44	3.95	4.24			
				Factor							1.00		1.00						
				Indicator Score							4.16		4.17						0.0%
				Pavement Index													4.10		
Segment 2		*Interstate?*			No														
Milepost	295	to	296		2	37.57	4.00	2	55.88	2.00	4.33	4.1	4.04	4.5	4.20	4.17		0	0
Milepost	296	to	297		2	39.31	0.00	2	47.93	4.00	4.31	5.0	4.17	4.1	4.51	4.15		0	0
Milepost	297	to	298		2	34.27	4.00	2	50.87	0.00	4.39	4.1	4.12	5.0	4.21	4.38		0	0
Milepost	298	to	299		2	33.36	1.00	2	71.73	2.00	4.40	4.7	3.81	4.5	4.48	4.00		0	0
Milepost	299	to	300		2	43.74	0.00	2	56.16	4.00	4.23	5.0	4.04	4.1	4.46	4.07		0	0
Milepost	300	to	301		2	41.00	0.00	2	46.54	4.00	4.28	5.0	4.19	4.1	4.50	4.15		0	0
Milepost	301	to	302		2	40.08	2.00	2	39.68	2.00	4.29	4.5	4.30	4.5	4.34	4.35		0	0
Milepost	302	to	303		2	38.37	0.00	2	39.98	3.00	4.32	5.0	4.30	4.3	4.53	4.29		0	0
Milepost	303	to	304		2	34.53	0.00	2	40.54	5.00	4.39	5.0	4.29	4.0	4.57	4.09		0	0
				Total	18			18											0
				Weighted Average							4.33	4.71	4.14	4.34	4.42	4.18			
				Factor							1.00		1.00						
				Indicator Score							4.33		4.14						0.0%
				Pavement Index													4.30		
Segment 3		*Interstate?*			No														
Milepost	304	to	305		2	36.25	0.00	2	85.88	1.00	4.36	5.0	3.61	4.7	4.55	3.92		0	0
Milepost	305	to	306		2	37.89	0.00	2	65.55	0.00	4.33	5.0	3.90	5.0	4.53	4.23		0	0
Milepost	306	to	307		2	105.47	0.00	2	123.16	4.00	3.35	5.0	3.13	4.1	3.84	3.43		0	0
Milepost	307	to	308		2	95.94	5.00	2	139.87	7.00	3.47	4.0	2.94	3.8	3.63	3.18		0	0
Milepost	308	to	309		2	127.99	0.00	2	100.99	7.00	3.07	5.0	3.41	3.8	3.65	3.51		0	0
Milepost	309	to	310		2	74.42	1.00	2	95.36	5.00	3.77	4.7	3.48	4.0	4.03	3.64		0	0
Milepost	310	to	311		2	93.52	4.00	2	100.36	12.00	3.50	4.1	3.41	3.2	3.69	3.28		0	0
Milepost	311	to	312		2	143.42	3.00	2	111.41	7.00	2.90	4.3	3.27	3.8	2.90	3.42		2	0

				Direction 1 (Southbound/Eastbound)			Direction 2 (Northbound/Westbound)			Direction 1 (Southbound/Eastbound)		Direction 2 (Northbound/Westbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	# of Lanes	IRI	Cracking	PSR	PDI	PSR	PDI	Dir 1 (SB/EB)	Dir 2 (NB/WB)		Dir 1 (SB/EB)	Dir 2 (NB/WB)
		Total		16			16											2
		Weighted Average								3.59	4.64	3.39	4.03	3.85	3.58			
		Factor								1.00		1.00						
		Indicator Score								3.59		3.39						6.3%
		Pavement Index														3.72		
Segment 4		*Interstate?*	No															
Milepost	312	to	313	4	145.73	7.00	0	0.00	0.00	2.87	3.8	5.00	5.0	2.87	5.00		4	0
Milepost	313	to	314	4	115.36	2.00	0	0.00	0.00	3.23	4.5	5.00	5.0	3.59	5.00		0	0
Milepost	314	to	315	4	92.83	1.00	0	0.00	0.00	3.51	4.7	5.00	5.0	3.86	5.00		0	0
Milepost	315	to	316	4	99.79	1.00	0	0.00	0.00	3.42	4.7	5.00	5.0	3.79	5.00		0	0
Milepost	316	to	317	4	105.33	2.00	0	0.00	0.00	3.35	4.5	5.00	5.0	3.68	5.00		0	0
		Total		20			0											4
		Weighted Average								3.28	4.39	#DIV/0!	#DIV/0!	3.56	#NUM!			
		Factor								1.00		1.00						
		Indicator Score								3.28		#DIV/0!						20.0%
		Pavement Index														3.56		
Segment 5		*Interstate?*	No															
Milepost	317	to	318	4	146.68	4.00	0	0.00	0.00	2.86	4.1	5.00	5.0	2.86	5.00		4	0
Milepost	318	to	319	4	116.97	6.00	0	0.00	0.00	3.21	3.9	5.00	5.0	3.41	5.00		0	0
Milepost	319	to	320	4	115.25	7.00	0	0.00	0.00	3.23	3.8	5.00	5.0	3.38	5.00		0	0
Milepost	320	to	321	4	119.32	9.00	0	0.00	0.00	3.18	3.5	5.00	5.0	3.28	5.00		0	0
Milepost	321	to	322	4	205.97	4.00	0	0.00	0.00	2.29	4.1	5.00	5.0	2.29	5.00		4	0
Milepost	322	to	323	4	86.09	12.00	0	0.00	0.00	3.60	3.2	5.00	5.0	3.34	5.00		0	0
Milepost	323	to	324	4	102.66	10.00	0	0.00	0.00	3.38	3.4	5.00	5.0	3.40	5.00		0	0
		Total		28			0											8
		Weighted Average								3.11	3.73	#DIV/0!	#DIV/0!	3.14	#NUM!			
		Factor								1.00		1.00						
		Indicator Score								3.11		#DIV/0!						28.6%
		Pavement Index														3.14		
Segment 6		*Interstate?*	No															
Milepost	324	to	325	2	80.32	8.00	0	0.00	0.00	3.68	3.6	5.00	5.0	3.65	5.00		0	0
Milepost	325	to	326	2	87.60	9.00	0	0.00	0.00	3.58	3.5	5.00	5.0	3.55	5.00		0	0
Milepost	326	to	327	2	83.93	6.00	0	0.00	0.00	3.63	3.9	5.00	5.0	3.71	5.00		0	0
Milepost	327	to	328	2	102.08	7.00	0	0.00	0.00	3.39	3.8	5.00	5.0	3.50	5.00		0	0
Milepost	328	to	329	2	126.89	6.00	0	0.00	0.00	3.09	3.9	5.00	5.0	3.32	5.00		0	0
Milepost	329	to	330	2	91.90	2.00	0	0.00	0.00	3.53	4.5	5.00	5.0	3.80	5.00		0	0
Milepost	330	to	331	2	103.57	2.00	0	0.00	0.00	3.37	4.5	5.00	5.0	3.70	5.00		0	0

				Direction 1 (Southbound/Eastbound)			Direction 2 (Northbound/Westbound)			Direction 1 (Southbound/Eastbound)		Direction 2 (Northbound/Westbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	# of Lanes	IRI	Cracking	PSR	PDI	PSR	PDI	Dir 1 (SB/EB)	Dir 2 (NB/WB)		Dir 1 (SB/EB)	Dir 2 (NB/WB)
Milepost	331	to	332	2	83.43	1.00	0	0.00	0.00	3.64	4.7	5.00	5.0	3.95	5.00		0	0
Milepost	332	to	333	2	81.08	2.00	0	0.00	0.00	3.67	4.5	5.00	5.0	3.91	5.00		0	0
Milepost	333	to	334	2	70.19	2.00	0	0.00	0.00	3.83	4.5	5.00	5.0	4.02	5.00		0	0
Milepost	334	to	335	2	81.06	0.00	0	0.00	0.00	3.67	5.0	5.00	5.0	4.07	5.00		0	0
Milepost	335	to	336	2	94.40	3.00	0	0.00	0.00	3.49	4.3	5.00	5.0	3.73	5.00		0	0
			Total	24			0											0
			Weighted Average							3.55	4.20	#DIV/0!	#DIV/0!	3.74	#NUM!			
			Factor							1.00		1.00						
			Indicator Score							3.55		#DIV/0!						0.0%
			Pavement Index													3.74		
Segment 7		*Interstate?*		No														
Milepost	333-80	to	334-80	2	39.92	30.00	0	0.00	0.00	4.30	1.7	5.00	5.0	1.74	5.00		2	0
Milepost	334-80	to	335-80	2	42.84	40.00	0	0.00	0.00	4.25	1.1	5.00	5.0	1.06	5.00		2	0
Milepost	335-80	to	336-80	2	39.69	12.00	0	0.00	0.00	4.30	3.2	5.00	5.0	3.54	5.00		0	0
Milepost	336-80	to	337-80	2	38.83	30.00	0	0.00	0.00	4.31	1.7	5.00	5.0	1.74	5.00		2	0
Milepost	337-80	to	338	2	45.26	30.00	0	0.00	0.00	4.21	1.7	5.00	5.0	1.74	5.00		2	0
Milepost	338	to	339	2	52.19	5.00	0	0.00	0.00	4.10	4.0	5.00	5.0	4.03	5.00		0	0
			Total	12			0											8
			Weighted Average							4.24	2.25	#DIV/0!	#DIV/0!	2.31	#NUM!			
			Factor							1.00		1.00						
			Indicator Score							4.24		#DIV/0!						66.7%
			Pavement Index													2.31		
Segment 8		*Interstate?*		No														
Milepost	339	to	340	3.0	121.63	4.00	0	0.00	0.00	3.15	4.1	5.00	5.0	3.45	5.00		0	0
Milepost	340	to	341	3.0	98.76	1.00	0	0.00	0.00	3.44	4.7	5.00	5.0	3.80	5.00		0	0
Milepost	341	to	342	4	121.20	1.00	0	0.00	0.00	3.15	4.7	5.00	5.0	3.60	5.00		0	0
Milepost	342	to	343	4	129.67	7.00	0	0.00	0.00	3.05	3.8	5.00	5.0	3.26	5.00		0	0
Milepost	343	to	344	3	217.11	5.00	0	0.00	0.00	2.19	4.0	5.00	5.0	2.19	5.00		3	0
Milepost	344	to	345	3	83.58	5.00	0	0.00	0.00	3.64	4.0	5.00	5.0	3.75	5.00		0	0
			Total	20			0											3
			Weighted Average							3.10	4.20	#DIV/0!	#DIV/0!	3.35	#NUM!			
			Factor							1.00		1.00						
			Indicator Score							3.10		#DIV/0!						15.0%
			Pavement Index													3.35		
Segment 9		*Interstate?*		No														
Milepost	345	to	346	2	82.74	0.00	0	0.00	0.00	3.65	5.0	5.00	5.0	4.06	5.00		0	0
Milepost	346	to	347	2	61.66	0.00	0	0.00	0.00	3.96	5.0	5.00	5.0	4.27	5.00		0	0

				Direction 1 (Southbound/Eastbound)			Direction 2 (Northbound/Westbound)			Direction 1 (Southbound/Eastbound)		Direction 2 (Northbound/Westbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	# of Lanes	IRI	Cracking	PSR	PDI	PSR	PDI	Dir 1 (SB/EB)	Dir 2 (NB/WB)		Dir 1 (SB/EB)	Dir 2 (NB/WB)
Milepost	347	to	348	2	80.15	2.00	0	0.00	0.00	3.69	4.5	5.00	5.0	3.92	5.00		0	0
Milepost	348	to	349	2	73.39	0.00	0	0.00	0.00	3.78	5.0	5.00	5.0	4.15	5.00		0	0
Milepost	349	to	350	2	51.89	2.00	0	0.00	0.00	4.11	4.5	5.00	5.0	4.21	5.00		0	0
Milepost	350	to	351	2	54.25	0.00	0	0.00	0.00	4.07	5.0	5.00	5.0	4.35	5.00		0	0
Milepost	351	to	352	2	44.96	0.00	0	0.00	0.00	4.21	5.0	5.00	5.0	4.45	5.00		0	0
Milepost	352	to	353	2	82.69	0.00	0	0.00	0.00	3.65	5.0	5.00	5.0	4.06	5.00		0	0
Milepost	353	to	354	2	73.09	4.00	0	0.00	0.00	3.79	4.1	5.00	5.0	3.89	5.00		0	0
Milepost	354	to	355	2	76.41	15.00	0	0.00	0.00	3.74	2.9	5.00	5.0	3.18	5.00		0	0
Milepost	355	to	356	2	84.59	5.00	0	0.00	0.00	3.63	4.0	5.00	5.0	3.74	5.00		0	0
Milepost	356	to	357	2	91.97	10.00	0	0.00	0.00	3.53	3.4	5.00	5.0	3.45	5.00		0	0
			Total	24			0											0
			Weighted Average							3.82	4.45	#DIV/0!	#DIV/0!	3.98	#NUM!			
			Factor							1.00		1.00						
			Indicator Score							3.82		#DIV/0!						0.0%
			Pavement Index													3.98		
Segment 10		*Interstate?*		No														
Milepost	357	to	358	2	71.44	2.00	2	68.91	6.00	3.81	4.5	3.85	3.9	4.00	3.86		0	0
Milepost	358	to	359	2	77.87	0.00	2	58.13	0.00	3.72	5.0	4.01	5.0	4.10	4.31		0	0
Milepost	359	to	360	2	65.43	4.00	2	55.34	0.00	3.90	4.1	4.05	5.0	3.97	4.34		0	0
Milepost	360	to	361	2	65.49	0.00	2	70.07	0.00	3.90	5.0	3.83	5.0	4.23	4.18		0	0
Milepost	361	to	362	2	87.21	0.00	2	81.58	2.00	3.59	5.0	3.67	4.5	4.01	3.90		0	0
Milepost	362	to	363	2	102.84	12.00	2	73.81	12.00	3.38	3.2	3.78	3.2	3.27	3.39		0	0
Milepost	363	to	364	2	94.90	15.00	2	79.12	8.00	3.49	2.9	3.70	3.6	3.10	3.66		0	0
Milepost	364	to	365	2	103.58	12.00	2	168.03	9.00	3.37	3.2	2.64	3.5	3.27	2.64		0	2
			Total	16			16											2
			Weighted Average							3.64	4.12	3.69	4.21	3.75	3.78			
			Factor							1.00		1.00						
			Indicator Score							3.64		3.69						6.3%
			Pavement Index													3.76		

Bridge Performance Area Data

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency: Sufficiency Rating	Bridge Index: Deck (N58)	Bridge Index: Sub (N59)	Bridge Index: Super (N60)	Bridge Index: Eval (N67)	Bridge Index: Lowest	Functionally Obsolete Bridges: Deck Area on Func Obsolete	Bridge Rating	Hot Spots on Bridge Index map
Segment 1												
N/A - No Bridges in Segment		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Total			#N/A									
Weighted Average				#N/A					#N/A	#N/A		
Factor				1.00					1.00	1.00		
Indicator Score				#N/A						#N/A	#N/A	
Bridge Index									#N/A			
Segment 2												
Middle Canyon Wash BR NB	2558	299.80	5645	97.60	7.00	8.00	7.00	7.00	7.0	0		
Middle Canyon Wsh Br SB	698	299.86	5966	91.60	6.00	6.00	6.00	6.00	6.0	0		
Total			11,611									
Weighted Average				94.52					6.49	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				94.52						0.00%	6	
Bridge Index									6.49			
Segment 3												
Rain Valley Wash Bridge NB	2519	309.30	10280	97.50	7.00	7.00	7.00	7.00	7.0	0		
Rain Valley Wash Br SB	914	309.40	9280	95.40	7.00	7.00	7.00	7.00	7.0	0		
Babocomari Wash Bridge	2518	311.80	8763	90.60	6.00	6.00	6.00	6.00	6.0	0		
Total			28,323									
Weighted Average				94.68					6.69	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				94.68						0.00%	6	
Bridge Index									6.69			
Segment 4												
N/A - No Bridges in Segment		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Total			#N/A									
Weighted Average				#N/A					#N/A	#N/A		
Factor				1.00					1.00	1.00		
Indicator Score				#N/A						#N/A	#N/A	
Bridge Index									#N/A			
Segment 5												
N/A - No Bridges in Segment		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Total			#N/A									

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency	Bridge Index					Functionally Obsolete Bridges	Bridge Rating	Hot Spots on Bridge Index map
				Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest	Deck Area on Func Obsolete		
Weighted Average				#N/A					#N/A	#N/A		
Factor				1.00					1.00	1.00		
Indicator Score				#N/A						#N/A	#N/A	
Bridge Index									#N/A			
Segment 6												
San Pedro River Br	2944	328.64	16286	96.30	7.00	8.00	7.00	7.00	7.0	0		
Lewis Springs OP	470	328.85	4068	84.30	5.00	5.00	6.00	5.00	5.0	0		
Total			20,354									
Weighted Average				93.90					6.60	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				93.90						0.00%	5	
Bridge Index									6.60			
Segment 7												
Tombstone Canyon Br 1	480	333.27	3575	67.60	6.00	6.00	6.00	6.00	6.0	3,575		
Tombstone Canyon Br 2	481	334.19	2701	87.10	6.00	6.00	6.00	6.00	6.0	0		
Bridge	468	336.45	1092	74.90	6.00	6.00	5.00	5.00	5.0	0		
Total			7,368									
Weighted Average				75.83					5.85	48.52%		
Factor				1.00					1.00	1.00		
Indicator Score				75.83						48.52%	5	
Bridge Index									5.85			
Segment 8												
West Blvd TI OP	614	339.81	2907	76.10	7.00	7.00	5.00	5.00	5.0	0		
Brewery Gulch TI OP	670	341.42	3302	94.00	7.00	7.00	7.00	7.00	7.0	3,302		
Lowell RR UP	269	343.01	1378	-2.00	N	6.00	7.00	N	6.0	0		
Lowell UP RR	1033	343.01	824	-2.00	N	6.00	6.00	N	6.0	0		
Mule Pass Bridge	2557	343.98	4887	89.40	6.00	6.00	6.00	6.00	6.0	0		
Total			13,298									
Weighted Average				87.28					6.03	24.83%		
Factor				1.00					1.00	1.00		
Indicator Score				87.28						24.83%	5	
Bridge Index									6.03			
Segment 9												
Mulepass-Lowell Arch	130	348.15	3518	56.00	N	5.00	6.00	5.00	5.0	0		
Bridge	235	349.28	1523	68.60	5.00	5.00	6.00	5.00	5.0	0		
Bridge	236	350.72	2030	87.00	6.00	6.00	6.00	6.00	6.0	0		

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency	Bridge Index					Functionally Obsolete Bridges	Bridge Rating	Hot Spots on Bridge Index map
				Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest	Deck Area on Func Obsolete		
Glance Creek Bridge	237	352.38	5288	63.10	5.00	5.00	5.00	5.00	5.0	0		
Wash Bridge	238	355.05	4537	75.70	6.00	6.00	6.00	6.00	6.0	0		
Total			16,896									
Weighted Average				68.37					5.39	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				68.37						0.00%	5	
Bridge Index									5.39			
Segment 10												
White Water Draw Br	1626	364.29	24111	89.90	5.00	6.00	7.00	6.00	5.0	0		
Total			24,111									
Weighted Average				89.90					5.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				89.90						0.00%	5	
Bridge Index									5.00			

Mobility Performance Area Data

Segment	Begin MP	End MP	Length (mi)	Facility Type	Flow Type	Terrain	No. of Lanes	Capacity Environment Type	Lane Width (feet)	EB/NB Right Shoulder Width	WB/SB Right Shoulder Width	EB/NB Left Shoulder Width	WB/SB Left Shoulder Width	NB/EB AADT	SB/WB AADT	2015 AADT	K Factor	D Factor	T Factor	Weighted Average Posted Speed Limit (mph)	Divided or Undivided	Access Points (per mile)	% No-Passing Zone
90-1	289.3	294.54	5.29	Rural	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	9.49	10.00	N/A	N/A	4784	4784	9568	10%	50%	20%	60	Divided	N/A	0%
90-2	294.5	304.49	9.95	Rural	Interrupted	Level	4	Multilane Highway	12.00	10.00	10.00	10.00	4.00	4780	4726	9507	10%	50%	17%	63	Divided	0.666666 67	0%
90-3	304.5	311.78	7.29	Rural	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	9.84	10.00	N/A	N/A	5823	5776	11600	10%	50%	12%	62	Divided	N/A	0%
90-4	311.8	317.2	5.42	Rural	Uninterrupted	Level	4	Multilane Highway	12.00	8.34	8.23	8.23	N/A	7813	7813	15626	9%	50%	9%	55	Undivided	2.4	0%
90-5	317.2	323.99	6.79	Urban	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	5.22	5.22	N/A	N/A	6735	7786	14521	9%	54%	7%	53	Undivided	N/A	0%
90-6	324	336.4	12.41	Rural	Interrupted	Level	2	Urban/Rural Single or Multilane Signalized	12.00	5.08	5.10	N/A	N/A	2317	2317	4634	11%	50%	7%	63	Undivided	N/A	25%
80-7	333.9	339	5.12	Rural	Uninterrupted	Mountainous	2	Rural Two-Lane, Non-Signalized	12.00	5.00	4.61	N/A	N/A	2553	2676	5229	9%	51%	10%	54	Undivided	1.171875	50%
80-8	339	345.13	6.13	Fringe Urban	Interrupted	Mountainous	2	Urban/Rural Single or Multilane Signalized	12.00	3.02	3.30	N/A	N/A	2827	2423	5250	9%	57%	16%	43	Undivided	N/A	50%
80-9	345.1	357.08	11.95	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	6.06	6.57	N/A	N/A	2504	2503	5007	8%	50%	19%	62	Undivided	0.585774 06	25%
80-10	357.1	364.67	7.59	Rural	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	8.50	8.74	N/A	N/A	2321	2296	4618	10%	50%	22%	64	Divided	N/A	0%

Car TTI and PTI/Truck TTTI and TPTI – Northbound/Westbound

Segment	TMC	timeperiod	week type	road number	road direction	cars mean	trucks mean	cars P05	trucks P05	Posted Speed limit	Assumed car free-flow speed	Assumed truck free-flow speed	cars TTI	Trucks TTI	cars PTI	Trucks PTI	Cars PeakTTI	Trucks PeakTTI	Cars PeakPTI	Trucks PeakPTI
90-1	115P05861	1 AM Peak	Weekday	AZ-90	Northbound	47.6	30.5	8.7	6.5	61	61	61	1.28	2.00	7.01	9.35	1.28	2.00	7.01	9.35
90-1	115P05861	2 Mid Day	Weekday	AZ-90	Northbound	52.0	38.3	11.8	7.5	61	61	61	1.17	1.59	5.17	8.18				
90-1	115P05861	3 PM Peak	Weekday	AZ-90	Northbound	52.8	36.9	13.7	6.8	61	61	61	1.16	1.65	4.46	8.92				
90-1	115P05861	4 Evening	Weekday	AZ-90	Northbound	44.1	28.4	5.6	5.0	61	61	61	1.38	2.15	10.91	12.27				
90-2	115P06934	1 AM Peak	Weekday	AZ-90	Northbound	58.7	55.3	31.7	25.2	63	63	63	1.07	1.14	1.99	2.50	1.10	1.17	2.82	3.56
90-2	115P06934	2 Mid Day	Weekday	AZ-90	Northbound	58.3	54.9	28.5	28.0	63	63	63	1.08	1.15	2.21	2.25				
90-2	115P06934	3 PM Peak	Weekday	AZ-90	Northbound	57.8	53.9	22.4	17.7	63	63	63	1.09	1.17	2.82	3.56				
90-2	115P06934	4 Evening	Weekday	AZ-90	Northbound	57.2	55.7	26.2	28.8	63	63	63	1.10	1.13	2.40	2.19				
90-2	115P05861	1 AM Peak	Weekday	AZ-90	Northbound	47.6	30.5	8.7	6.5	61	61	61	1.28	2.00	7.01	9.35	1.28	2.00	7.01	9.35
90-2	115P05861	2 Mid Day	Weekday	AZ-90	Northbound	52.0	38.3	11.8	7.5	61	61	61	1.17	1.59	5.17	8.18				
90-2	115P05861	3 PM Peak	Weekday	AZ-90	Northbound	52.8	36.9	13.7	6.8	61	61	61	1.16	1.65	4.46	8.92				
90-2	115P05861	4 Evening	Weekday	AZ-90	Northbound	44.1	28.4	5.6	5.0	61	61	61	1.38	2.15	10.91	12.27				
90-3	115P05860	1 AM Peak	Weekday	AZ-90	Northbound	53.2	49.5	34.5	23.0	54	54	54	1.02	1.09	1.57	2.35	1.02	1.10	1.57	2.63
90-3	115P05860	2 Mid Day	Weekday	AZ-90	Northbound	53.0	49.4	36.7	23.0	54	54	54	1.02	1.09	1.47	2.35				
90-3	115P05860	3 PM Peak	Weekday	AZ-90	Northbound	53.7	49.0	38.7	20.5	54	54	54	1.01	1.10	1.39	2.63				
90-3	115P05860	4 Evening	Weekday	AZ-90	Northbound	52.7	49.3	34.8	23.0	54	54	54	1.02	1.10	1.55	2.35				
90-3	115P07206	1 AM Peak	Weekday	AZ-90	Northbound	57.7	55.4	38.9	37.2	55	55	55	1.00	1.00	1.41	1.48	1.00	1.06	1.48	2.68
90-3	115P07206	2 Mid Day	Weekday	AZ-90	Northbound	57.5	54.7	39.2	35.8	55	55	55	1.00	1.01	1.40	1.54				
90-3	115P07206	3 PM Peak	Weekday	AZ-90	Northbound	57.6	52.0	40.2	20.5	55	55	55	1.00	1.06	1.37	2.68				
90-3	115P07206	4 Evening	Weekday	AZ-90	Northbound	56.2	55.1	37.2	38.0	55	55	55	1.00	1.00	1.48	1.45				
90-3	115P06934	1 AM Peak	Weekday	AZ-90	Northbound	58.7	55.3	31.7	25.2	63	63	63	1.07	1.14	1.99	2.50	1.10	1.17	2.82	3.56
90-3	115P06934	2 Mid Day	Weekday	AZ-90	Northbound	58.3	54.9	28.5	28.0	63	63	63	1.08	1.15	2.21	2.25				
90-3	115P06934	3 PM Peak	Weekday	AZ-90	Northbound	57.8	53.9	22.4	17.7	63	63	63	1.09	1.17	2.82	3.56				
90-3	115P06934	4 Evening	Weekday	AZ-90	Northbound	57.2	55.7	26.2	28.8	63	63	63	1.10	1.13	2.40	2.19				
90-4	115P05860	1 AM Peak	Weekday	AZ-90	Northbound	53.2	49.5	34.5	23.0	54	54	54	1.02	1.09	1.57	2.35	1.02	1.10	1.57	2.63
90-4	115P05860	2 Mid Day	Weekday	AZ-90	Northbound	53.0	49.4	36.7	23.0	54	54	54	1.02	1.09	1.47	2.35				
90-4	115P05860	3 PM Peak	Weekday	AZ-90	Northbound	53.7	49.0	38.7	20.5	54	54	54	1.01	1.10	1.39	2.63				
90-4	115P05860	4 Evening	Weekday	AZ-90	Northbound	52.7	49.3	34.8	23.0	54	54	54	1.02	1.10	1.55	2.35				
90-5	115P05859	1 AM Peak	Weekday	AZ-90	Northbound	30.9	29.2	3.1	5.6	45	45	45	1.46	1.54	14.48	8.04	1.65	1.80	20.69	9.05
90-5	115P05859	2 Mid Day	Weekday	AZ-90	Northbound	27.8	26.4	4.4	5.0	45	45	45	1.62	1.71	10.34	9.05				
90-5	115P05859	3 PM Peak	Weekday	AZ-90	Northbound	27.5	25.0	3.7	6.8	45	45	45	1.63	1.80	12.07	6.58				
90-5	115P05859	4 Evening	Weekday	AZ-90	Northbound	27.3	27.9	2.2	7.5	45	45	45	1.65	1.61	20.69	6.03				
90-5	115P06930	1 AM Peak	Weekday	AZ-90	Northbound	45.9	41.5	20.5	10.6	55	55	55	1.20	1.33	2.68	5.20	1.27	1.33	3.54	5.20
90-5	115P06930	2 Mid Day	Weekday	AZ-90	Northbound	43.4	42.7	17.7	12.4	55	55	55	1.27	1.29	3.12	4.42				
90-5	115P06930	3 PM Peak	Weekday	AZ-90	Northbound	43.2	44.5	15.5	19.6	55	55	55	1.27	1.24	3.54	2.81				

Segment	TMC	timeperiod	week type	road number	road direction	cars mean	trucks mean	cars P05	trucks P05	Posted Speed limit	Assumed car free-flow speed	Assumed truck free-flow speed	cars TTI	Trucks TTI	cars PTI	Trucks PTI	Cars PeakTTI	Trucks PeakTTI	Cars PeakPTI	Trucks PeakPTI
90-5	115P06930	4 Evening	Weekday	AZ-90	Northbound	46.2	48.3	23.6	28.0	55	55	55	1.19	1.14	2.33	1.97				
90-5	115P06931	1 AM Peak	Weekday	AZ-90	Northbound	38.4	38.1	9.6	13.7	55	55	55	1.43	1.44	5.75	4.02	1.53	1.50	8.21	5.20
90-5	115P06931	2 Mid Day	Weekday	AZ-90	Northbound	36.2	37.6	7.3	12.4	55	55	55	1.52	1.46	7.59	4.43				
90-5	115P06931	3 PM Peak	Weekday	AZ-90	Northbound	36.0	36.8	6.7	10.6	55	55	55	1.53	1.50	8.21	5.20				
90-5	115P06931	4 Evening	Weekday	AZ-90	Northbound	39.3	39.6	9.5	14.9	55	55	55	1.40	1.39	5.82	3.68				
90-5	115P06932	1 AM Peak	Weekday	AZ-90	Northbound	48.5	47.1	21.7	23.9	55	55	55	1.13	1.17	2.53	2.30	1.13	1.17	2.53	2.30
90-5	115P06932	2 Mid Day	Weekday	AZ-90	Northbound	48.9	47.4	24.9	24.9	55	55	55	1.12	1.16	2.21	2.21				
90-5	115P06932	3 PM Peak	Weekday	AZ-90	Northbound	48.7	47.7	22.7	29.8	55	55	55	1.13	1.15	2.43	1.85				
90-5	115P06932	4 Evening	Weekday	AZ-90	Northbound	49.6	48.8	28.8	30.8	55	55	55	1.11	1.13	1.91	1.79				
90-5	115P06933	1 AM Peak	Weekday	AZ-90	Northbound	47.4	44.8	15.5	13.7	55	55	55	1.16	1.23	3.54	4.02	1.17	1.26	4.65	5.53
90-5	115P06933	2 Mid Day	Weekday	AZ-90	Northbound	47.8	44.6	18.6	11.8	55	55	55	1.15	1.23	2.95	4.65				
90-5	115P06933	3 PM Peak	Weekday	AZ-90	Northbound	46.9	43.8	11.8	9.9	55	55	55	1.17	1.26	4.65	5.53				
90-5	115P06933	4 Evening	Weekday	AZ-90	Northbound	47.4	45.9	19.2	19.2	55	55	55	1.16	1.20	2.86	2.86				
90-6	115P06928	1 AM Peak	Weekday	AZ-90	Northbound	63.5	56.1	54.3	39.7	63	63	63	1.00	1.12	1.16	1.58	1.04	1.16	1.35	1.72
90-6	115P06928	2 Mid Day	Weekday	AZ-90	Northbound	62.0	55.5	50.6	36.7	63	63	63	1.02	1.14	1.24	1.72				
90-6	115P06928	3 PM Peak	Weekday	AZ-90	Northbound	62.8	56.9	52.9	44.8	63	63	63	1.00	1.11	1.19	1.41				
90-6	115P06928	4 Evening	Weekday	AZ-90	Northbound	60.8	54.3	46.7	39.7	63	63	63	1.04	1.16	1.35	1.58				
90-6	115P06929	1 AM Peak	Weekday	AZ-90	Northbound	61.3	53.5	42.3	20.4	65	65	65	1.06	1.22	1.54	3.19	1.07	1.22	1.54	3.19
90-6	115P06929	2 Mid Day	Weekday	AZ-90	Northbound	60.9	55.5	47.3	28.0	65	65	65	1.07	1.17	1.37	2.33				
90-6	115P06929	3 PM Peak	Weekday	AZ-90	Northbound	61.4	55.9	46.6	24.6	65	65	65	1.06	1.16	1.40	2.64				
90-6	115P06929	4 Evening	Weekday	AZ-90	Northbound	60.5	54.8	46.2	41.6	65	65	65	1.07	1.19	1.41	1.56				
90-6	115P06930	1 AM Peak	Weekday	AZ-90	Northbound	45.9	41.5	20.5	10.6	55	55	55	1.20	1.33	2.68	5.20	1.27	1.33	3.54	5.20
90-6	115P06930	2 Mid Day	Weekday	AZ-90	Northbound	43.4	42.7	17.7	12.4	55	55	55	1.27	1.29	3.12	4.42				
90-6	115P06930	3 PM Peak	Weekday	AZ-90	Northbound	43.2	44.5	15.5	19.6	55	55	55	1.27	1.24	3.54	2.81				
90-6	115P06930	4 Evening	Weekday	AZ-90	Northbound	46.2	48.3	23.6	28.0	55	55	55	1.19	1.14	2.33	1.97				
80-7	115P05852	1 AM Peak	Weekday	AZ-80	Westbound	56.0	53.6	47.7	39.8	55	55	55	1.00	1.03	1.15	1.38	1.00	1.04	1.20	1.38
80-7	115P05852	2 Mid Day	Weekday	AZ-80	Westbound	55.4	53.4	46.7	44.7	55	55	55	1.00	1.03	1.18	1.23				
80-7	115P05852	3 PM Peak	Weekday	AZ-80	Westbound	55.5	55.8	46.7	46.7	55	55	55	1.00	1.00	1.18	1.18				
80-7	115P05852	4 Evening	Weekday	AZ-80	Westbound	56.0	53.1	45.7	39.8	55	55	55	1.00	1.04	1.20	1.38				
80-7	115P06919	1 AM Peak	Weekday	AZ-80	Westbound	53.9	49.4	40.9	32.9	49	49	49	1.00	1.00	1.20	1.49	1.00	1.01	1.32	1.49
80-7	115P06919	2 Mid Day	Weekday	AZ-80	Westbound	53.3	49.6	40.5	38.1	49	49	49	1.00	1.00	1.21	1.29				
80-7	115P06919	3 PM Peak	Weekday	AZ-80	Westbound	52.3	52.1	39.3	41.8	49	49	49	1.00	1.00	1.25	1.17				
80-7	115P06919	4 Evening	Weekday	AZ-80	Westbound	52.6	48.5	37.0	36.6	49	49	49	1.00	1.01	1.32	1.34				
80-8	115P05851	1 AM Peak	Weekday	AZ-80	Westbound	47.6	45.7	27.4	19.9	51	51	51	1.07	1.12	1.86	2.56	1.12	1.14	2.28	2.90
80-8	115P05851	2 Mid Day	Weekday	AZ-80	Westbound	46.3	44.7	24.7	17.6	51	51	51	1.10	1.14	2.07	2.90				
80-8	115P05851	3 PM Peak	Weekday	AZ-80	Westbound	45.5	47.2	22.4	23.0	51	51	51	1.12	1.08	2.28	2.22				
80-8	115P05851	4 Evening	Weekday	AZ-80	Westbound	46.5	46.3	24.3	19.9	51	51	51	1.10	1.10	2.09	2.56				

Segment	TMC	timeperiod	week type	road number	road direction	cars mean	trucks mean	cars P05	trucks P05	Posted Speed limit	Assumed car free-flow speed	Assumed truck free-flow speed	cars TTI	Trucks TTI	cars PTI	Trucks PTI	Cars PeakTTI	Trucks PeakTTI	Cars PeakPTI	Trucks PeakPTI
80-8	115P11217	1 AM Peak	Weekday	AZ-80	Westbound	40.8	35.7	27.3	20.8	41	41	41	1.01	1.15	1.50	1.97	1.07	1.15	1.83	2.27
80-8	115P11217	2 Mid Day	Weekday	AZ-80	Westbound	39.3	35.6	24.9	18.0	41	41	41	1.04	1.15	1.65	2.27				
80-8	115P11217	3 PM Peak	Weekday	AZ-80	Westbound	39.3	39.3	24.9	21.8	41	41	41	1.04	1.04	1.65	1.88				
80-8	115P11217	4 Evening	Weekday	AZ-80	Westbound	38.2	36.0	22.4	21.8	41	41	41	1.07	1.14	1.83	1.88				
80-8	115P06919	1 AM Peak	Weekday	AZ-80	Westbound	53.9	49.4	40.9	32.9	49	49	49	1.00	1.00	1.20	1.49	1.00	1.01	1.32	1.49
80-8	115P06919	2 Mid Day	Weekday	AZ-80	Westbound	53.3	49.6	40.5	38.1	49	49	49	1.00	1.00	1.21	1.29				
80-8	115P06919	3 PM Peak	Weekday	AZ-80	Westbound	52.3	52.1	39.3	41.8	49	49	49	1.00	1.00	1.25	1.17				
80-8	115P06919	4 Evening	Weekday	AZ-80	Westbound	52.6	48.5	37.0	36.6	49	49	49	1.00	1.01	1.32	1.34				
80-9	115P06917	1 AM Peak	Weekday	AZ-80	Westbound	64.7	62.4	55.9	56.7	65	65	65	1.00	1.04	1.16	1.15	1.07	1.05	1.37	1.16
80-9	115P06917	2 Mid Day	Weekday	AZ-80	Westbound	64.0	62.1	54.4	55.9	65	65	65	1.02	1.05	1.19	1.16				
80-9	115P06917	3 PM Peak	Weekday	AZ-80	Westbound	63.3	62.9	52.8	56.6	65	65	65	1.03	1.03	1.23	1.15				
80-9	115P06917	4 Evening	Weekday	AZ-80	Westbound	61.0	62.1	47.6	55.9	65	65	65	1.07	1.05	1.37	1.16				
80-9	115P06918	1 AM Peak	Weekday	AZ-80	Westbound	64.2	61.7	55.9	55.1	65	65	65	1.01	1.05	1.16	1.18	1.07	1.06	1.29	1.20
80-9	115P06918	2 Mid Day	Weekday	AZ-80	Westbound	63.6	61.6	55.3	54.2	65	65	65	1.02	1.06	1.18	1.20				
80-9	115P06918	3 PM Peak	Weekday	AZ-80	Westbound	63.2	62.3	54.6	55.9	65	65	65	1.03	1.04	1.19	1.16				
80-9	115P06918	4 Evening	Weekday	AZ-80	Westbound	60.9	61.5	50.4	54.6	65	65	65	1.07	1.06	1.29	1.19				
80-9	115P05851	1 AM Peak	Weekday	AZ-80	Westbound	47.6	45.7	27.4	19.9	51	51	51	1.07	1.12	1.86	2.56	1.12	1.14	2.28	2.90
80-9	115P05851	2 Mid Day	Weekday	AZ-80	Westbound	46.3	44.7	24.7	17.6	51	51	51	1.10	1.14	2.07	2.90				
80-9	115P05851	3 PM Peak	Weekday	AZ-80	Westbound	45.5	47.2	22.4	23.0	51	51	51	1.12	1.08	2.28	2.22				
80-9	115P05851	4 Evening	Weekday	AZ-80	Westbound	46.5	46.3	24.3	19.9	51	51	51	1.10	1.10	2.09	2.56				
80-10	115P06917	1 AM Peak	Weekday	AZ-80	Westbound	64.7	62.4	55.9	56.7	65	65	65	1.00	1.04	1.16	1.15	1.07	1.05	1.37	1.16
80-10	115P06917	2 Mid Day	Weekday	AZ-80	Westbound	64.0	62.1	54.4	55.9	65	65	65	1.02	1.05	1.19	1.16				
80-10	115P06917	3 PM Peak	Weekday	AZ-80	Westbound	63.3	62.9	52.8	56.6	65	65	65	1.03	1.03	1.23	1.15				
80-10	115P06917	4 Evening	Weekday	AZ-80	Westbound	61.0	62.1	47.6	55.9	65	65	65	1.07	1.05	1.37	1.16				
80-10	115P06916	1 AM Peak	Weekday	AZ-80	Westbound	61.1	56.6	44.8	32.7	63	63	63	1.03	1.11	1.41	1.93	1.09	1.13	1.78	2.07
80-10	115P06916	2 Mid Day	Weekday	AZ-80	Westbound	59.5	55.7	41.1	30.4	63	63	63	1.06	1.13	1.53	2.07				
80-10	115P06916	3 PM Peak	Weekday	AZ-80	Westbound	57.8	57.9	35.5	38.9	63	63	63	1.09	1.09	1.78	1.62				
80-10	115P06916	4 Evening	Weekday	AZ-80	Westbound	59.9	57.9	44.4	43.7	63	63	63	1.05	1.09	1.42	1.44				

Car TTI and PTI/Truck TTTI and TPTI – Southbound/Eastbound

Segment	TMC	timeperiod	week type	road number	road direction	cars mean	trucks mean	cars P05	trucks P05	Posted Speed limit	Assumed car free-flow speed	Assumed truck free-flow speed	cars TTI	Trucks TTI	cars PTI	Trucks PTI	Cars PeakTTI	Trucks PeakTTI	Cars PeakPTI	Trucks PeakPTI
90-1	115N05861	1 AM Peak	Weekday	AZ-90	Southbound	22.8	19.5	10.6	10.6	35	35	35	1.54	1.79	3.29	3.29	1.69	1.86	3.29	3.29
90-1	115N05861	2 Mid Day	Weekday	AZ-90	Southbound	23.7	19.8	11.7	11.7	35	35	35	1.48	1.77	2.98	2.98				
90-1	115N05861	3 PM Peak	Weekday	AZ-90	Southbound	23.0	19.3	10.6	10.6	35	35	35	1.52	1.81	3.29	3.29				
90-1	115N05861	4 Evening	Weekday	AZ-90	Southbound	20.8	18.8	10.6	10.6	35	35	35	1.69	1.86	3.29	3.29				
90-2	115N07206	1 AM Peak	Weekday	AZ-90	Southbound	67.2	63.6	61.5	59.2	63	63	63	1.00	1.00	1.02	1.06	1.00	1.00	1.11	1.08
90-2	115N07206	2 Mid Day	Weekday	AZ-90	Southbound	66.6	63.6	60.2	58.6	63	63	63	1.00	1.00	1.05	1.07				
90-2	115N07206	3 PM Peak	Weekday	AZ-90	Southbound	66.8	63.5	59.3	58.9	63	63	63	1.00	1.00	1.06	1.07				
90-2	115N07206	4 Evening	Weekday	AZ-90	Southbound	65.5	63.2	56.5	58.1	63	63	63	1.00	1.00	1.11	1.08				
90-3	115N05860	1 AM Peak	Weekday	AZ-90	Southbound	57.8	55.0	37.3	33.9	55	55	55	1.00	1.00	1.48	1.62	1.00	1.02	1.71	1.90
90-3	115N05860	2 Mid Day	Weekday	AZ-90	Southbound	56.9	54.4	35.1	32.3	55	55	55	1.00	1.01	1.57	1.70				
90-3	115N05860	3 PM Peak	Weekday	AZ-90	Southbound	56.7	53.8	32.2	28.9	55	55	55	1.00	1.02	1.71	1.90				
90-3	115N05860	4 Evening	Weekday	AZ-90	Southbound	57.1	54.9	38.5	38.2	55	55	55	1.00	1.00	1.43	1.44				
90-3	115N07206	1 AM Peak	Weekday	AZ-90	Southbound	67.2	63.6	61.5	59.2	63	63	63	1.00	1.00	1.02	1.06	1.00	1.00	1.11	1.08
90-3	115N07206	2 Mid Day	Weekday	AZ-90	Southbound	66.6	63.6	60.2	58.6	63	63	63	1.00	1.00	1.05	1.07				
90-3	115N07206	3 PM Peak	Weekday	AZ-90	Southbound	66.8	63.5	59.3	58.9	63	63	63	1.00	1.00	1.06	1.07				
90-3	115N07206	4 Evening	Weekday	AZ-90	Southbound	65.5	63.2	56.5	58.1	63	63	63	1.00	1.00	1.11	1.08				
90-3	115N06933	1 AM Peak	Weekday	AZ-90	Southbound	53.2	48.7	36.1	15.5	54	54	54	1.01	1.11	1.50	3.48	1.04	1.14	2.14	5.11
90-3	115N06933	2 Mid Day	Weekday	AZ-90	Southbound	52.1	48.4	32.8	17.4	54	54	54	1.04	1.11	1.64	3.10				
90-3	115N06933	3 PM Peak	Weekday	AZ-90	Southbound	51.8	47.4	25.3	10.6	54	54	54	1.04	1.14	2.14	5.11				
90-3	115N06933	4 Evening	Weekday	AZ-90	Southbound	51.9	48.1	31.7	17.4	54	54	54	1.04	1.12	1.70	3.10				
90-4	115N06933	1 AM Peak	Weekday	AZ-90	Southbound	53.2	48.7	36.1	15.5	54	54	54	1.01	1.11	1.50	3.48	1.04	1.14	2.14	5.11
90-4	115N06933	2 Mid Day	Weekday	AZ-90	Southbound	52.1	48.4	32.8	17.4	54	54	54	1.04	1.11	1.64	3.10				
90-4	115N06933	3 PM Peak	Weekday	AZ-90	Southbound	51.8	47.4	25.3	10.6	54	54	54	1.04	1.14	2.14	5.11				
90-4	115N06933	4 Evening	Weekday	AZ-90	Southbound	51.9	48.1	31.7	17.4	54	54	54	1.04	1.12	1.70	3.10				
90-5	115N05859	1 AM Peak	Weekday	AZ-90	Southbound	36.6	36.7	8.7	6.8	55	55	55	1.50	1.50	6.32	8.05	1.80	1.64	11.06	11.06
90-5	115N05859	2 Mid Day	Weekday	AZ-90	Southbound	32.7	34.9	5.6	5.6	55	55	55	1.68	1.57	9.83	9.83				
90-5	115N05859	3 PM Peak	Weekday	AZ-90	Southbound	30.6	33.6	5.0	5.0	55	55	55	1.80	1.64	11.06	11.06				
90-5	115N05859	4 Evening	Weekday	AZ-90	Southbound	35.5	35.5	5.6	6.8	55	55	55	1.55	1.55	9.83	8.05				
90-5	115N06930	1 AM Peak	Weekday	AZ-90	Southbound	33.7	31.1	5.6	5.6	45	45	45	1.34	1.45	8.04	8.04	1.53	1.73	13.17	12.07
90-5	115N06930	2 Mid Day	Weekday	AZ-90	Southbound	31.0	30.0	5.6	3.7	45	45	45	1.45	1.50	8.04	12.07				
90-5	115N06930	3 PM Peak	Weekday	AZ-90	Southbound	29.4	25.9	3.4	3.7	45	45	45	1.53	1.73	13.17	12.07				
90-5	115N06930	4 Evening	Weekday	AZ-90	Southbound	32.4	29.8	7.0	8.7	45	45	45	1.39	1.51	6.39	5.18				
90-5	115N06931	1 AM Peak	Weekday	AZ-90	Southbound	49.4	48.5	19.9	24.0	55	55	55	1.11	1.13	2.76	2.29	1.13	1.15	2.76	2.29
90-5	115N06931	2 Mid Day	Weekday	AZ-90	Southbound	50.1	48.9	24.9	27.1	55	55	55	1.10	1.13	2.21	2.03				
90-5	115N06931	3 PM Peak	Weekday	AZ-90	Southbound	48.6	47.7	19.9	27.7	55	55	55	1.13	1.15	2.76	1.99				
90-5	115N06931	4 Evening	Weekday	AZ-90	Southbound	52.3	51.2	28.6	30.8	55	55	55	1.05	1.07	1.92	1.79				

Segment	TMC	timeperiod	week type	road number	road direction	cars mean	trucks mean	cars P05	trucks P05	Posted Speed limit	Assumed car free-flow speed	Assumed truck free-flow speed	cars TTI	Trucks TTI	cars PTI	Trucks PTI	Cars PeakTTI	Trucks PeakTTI	Cars PeakPTI	Trucks PeakPTI
90-5	115N06932	1 AM Peak	Weekday	AZ-90	Southbound	49.6	43.8	26.7	20.5	55	55	55	1.11	1.26	2.06	2.68	1.13	1.26	2.36	2.68
90-5	115N06932	2 Mid Day	Weekday	AZ-90	Southbound	50.0	45.6	25.5	22.3	55	55	55	1.10	1.21	2.16	2.47				
90-5	115N06932	3 PM Peak	Weekday	AZ-90	Southbound	48.9	45.1	23.3	23.6	55	55	55	1.12	1.22	2.36	2.33				
90-5	115N06932	4 Evening	Weekday	AZ-90	Southbound	48.6	45.4	24.8	23.1	55	55	55	1.13	1.21	2.22	2.38				
90-5	115N06929	1 AM Peak	Weekday	AZ-90	Southbound	46.4	44.2	20.5	13.7	55	55	55	1.18	1.24	2.68	4.02	1.20	1.24	2.68	4.02
90-5	115N06929	2 Mid Day	Weekday	AZ-90	Southbound	45.9	44.8	23.6	21.8	55	55	55	1.20	1.23	2.33	2.53				
90-5	115N06929	3 PM Peak	Weekday	AZ-90	Southbound	46.9	46.5	24.4	20.5	55	55	55	1.17	1.18	2.25	2.68				
90-5	115N06929	4 Evening	Weekday	AZ-90	Southbound	48.2	50.8	24.4	36.6	55	55	55	1.14	1.08	2.25	1.50				
90-6	115N06928	1 AM Peak	Weekday	AZ-90	Southbound	61.7	54.3	50.3	29.8	65	65	65	1.05	1.20	1.29	2.18	1.06	1.20	1.33	2.18
90-6	115N06928	2 Mid Day	Weekday	AZ-90	Southbound	62.2	58.2	52.3	44.7	65	65	65	1.04	1.12	1.24	1.45				
90-6	115N06928	3 PM Peak	Weekday	AZ-90	Southbound	62.4	57.1	52.2	39.2	65	65	65	1.04	1.14	1.24	1.66				
90-6	115N06928	4 Evening	Weekday	AZ-90	Southbound	61.6	57.2	48.7	48.3	65	65	65	1.06	1.14	1.33	1.35				
90-6	115N06929	1 AM Peak	Weekday	AZ-90	Southbound	46.4	44.2	20.5	13.7	55	55	55	1.18	1.24	2.68	4.02	1.20	1.24	2.68	4.02
90-6	115N06929	2 Mid Day	Weekday	AZ-90	Southbound	45.9	44.8	23.6	21.8	55	55	55	1.20	1.23	2.33	2.53				
90-6	115N06929	3 PM Peak	Weekday	AZ-90	Southbound	46.9	46.5	24.4	20.5	55	55	55	1.17	1.18	2.25	2.68				
90-6	115N06929	4 Evening	Weekday	AZ-90	Southbound	48.2	50.8	24.4	36.6	55	55	55	1.14	1.08	2.25	1.50				
90-6	115N05858	1 AM Peak	Weekday	AZ-90	Southbound	59.6	52.2	44.2	32.8	63	63	63	1.06	1.21	1.42	1.92	1.08	1.21	1.51	2.31
90-6	115N05858	2 Mid Day	Weekday	AZ-90	Southbound	59.7	54.2	44.1	36.5	63	63	63	1.06	1.16	1.43	1.73				
90-6	115N05858	3 PM Peak	Weekday	AZ-90	Southbound	59.7	52.6	43.2	27.3	63	63	63	1.05	1.20	1.46	2.31				
90-6	115N05858	4 Evening	Weekday	AZ-90	Southbound	58.6	52.2	41.7	32.8	63	63	63	1.08	1.21	1.51	1.92				
80-7	115N11217	1 AM Peak	Weekday	AZ-80	Eastbound	48.5	39.6	30.5	26.5	49	49	49	1.01	1.24	1.61	1.85	1.10	1.36	1.92	1.97
80-7	115N11217	2 Mid Day	Weekday	AZ-80	Eastbound	48.9	40.5	34.1	25.5	49	49	49	1.00	1.21	1.44	1.92				
80-7	115N11217	3 PM Peak	Weekday	AZ-80	Eastbound	48.9	37.8	33.2	24.9	49	49	49	1.00	1.30	1.48	1.97				
80-7	115N11217	4 Evening	Weekday	AZ-80	Eastbound	44.6	36.0	25.5	24.9	49	49	49	1.10	1.36	1.92	1.97				
80-7	115N06919	1 AM Peak	Weekday	AZ-80	Eastbound	53.6	46.8	42.1	20.7	55	55	55	1.03	1.17	1.31	2.65	1.08	1.17	1.59	2.65
80-7	115N06919	2 Mid Day	Weekday	AZ-80	Eastbound	53.5	48.6	42.3	28.6	55	55	55	1.03	1.13	1.30	1.92				
80-7	115N06919	3 PM Peak	Weekday	AZ-80	Eastbound	53.9	47.8	43.5	28.4	55	55	55	1.02	1.15	1.26	1.94				
80-7	115N06919	4 Evening	Weekday	AZ-80	Eastbound	50.7	47.3	34.7	30.5	55	55	55	1.08	1.16	1.59	1.81				
80-8	115N05851	1 AM Peak	Weekday	AZ-80	Eastbound	38.5	35.6	19.9	16.8	41	41	41	1.07	1.15	2.06	2.44	1.13	1.17	2.36	2.64
80-8	115N05851	2 Mid Day	Weekday	AZ-80	Eastbound	37.7	35.2	19.9	16.8	41	41	41	1.09	1.16	2.06	2.44				
80-8	115N05851	3 PM Peak	Weekday	AZ-80	Eastbound	38.0	35.4	19.9	15.5	41	41	41	1.08	1.16	2.06	2.64				
80-8	115N05851	4 Evening	Weekday	AZ-80	Eastbound	36.2	35.1	17.4	17.4	41	41	41	1.13	1.17	2.36	2.36				
80-8	115N11217	1 AM Peak	Weekday	AZ-80	Eastbound	48.5	39.6	30.5	26.5	49	49	49	1.01	1.24	1.61	1.85	1.10	1.36	1.92	1.97
80-8	115N11217	2 Mid Day	Weekday	AZ-80	Eastbound	48.9	40.5	34.1	25.5	49	49	49	1.00	1.21	1.44	1.92				
80-8	115N11217	3 PM Peak	Weekday	AZ-80	Eastbound	48.9	37.8	33.2	24.9	49	49	49	1.00	1.30	1.48	1.97				
80-8	115N11217	4 Evening	Weekday	AZ-80	Eastbound	44.6	36.0	25.5	24.9	49	49	49	1.10	1.36	1.92	1.97				
80-8	115N06918	1 AM Peak	Weekday	AZ-80	Eastbound	50.6	50.0	31.7	29.8	51	51	51	1.01	1.02	1.61	1.71	1.03	1.05	1.61	1.82

Segment	TMC	timeperiod	week type	road number	road direction	cars mean	trucks mean	cars P05	trucks P05	Posted Speed limit	Assumed car free-flow speed	Assumed truck free-flow speed	cars TTI	Trucks TTI	cars PTI	Trucks PTI	Cars PeakTTI	Trucks PeakTTI	Cars PeakPTI	Trucks PeakPTI
80-8	115N06918	2 Mid Day	Weekday	AZ-80	Eastbound	50.2	49.6	33.6	30.5	51	51	51	1.02	1.03	1.52	1.67				
80-8	115N06918	3 PM Peak	Weekday	AZ-80	Eastbound	51.0	49.9	34.8	28.6	51	51	51	1.00	1.02	1.46	1.78				
80-8	115N06918	4 Evening	Weekday	AZ-80	Eastbound	49.5	48.8	32.9	28.0	51	51	51	1.03	1.05	1.55	1.82				
80-9	115N06917	1 AM Peak	Weekday	AZ-80	Eastbound	63.6	62.6	55.8	55.6	65	65	65	1.02	1.04	1.16	1.17	1.07	1.06	1.29	1.22
80-9	115N06917	2 Mid Day	Weekday	AZ-80	Eastbound	63.7	62.2	56.0	56.0	65	65	65	1.02	1.05	1.16	1.16				
80-9	115N06917	3 PM Peak	Weekday	AZ-80	Eastbound	64.1	61.2	56.6	54.8	65	65	65	1.01	1.06	1.15	1.19				
80-9	115N06917	4 Evening	Weekday	AZ-80	Eastbound	61.0	61.4	50.3	53.4	65	65	65	1.07	1.06	1.29	1.22				
80-9	115N06918	1 AM Peak	Weekday	AZ-80	Eastbound	50.6	50.0	31.7	29.8	51	51	51	1.01	1.02	1.61	1.71	1.03	1.05	1.61	1.82
80-9	115N06918	2 Mid Day	Weekday	AZ-80	Eastbound	50.2	49.6	33.6	30.5	51	51	51	1.02	1.03	1.52	1.67				
80-9	115N06918	3 PM Peak	Weekday	AZ-80	Eastbound	51.0	49.9	34.8	28.6	51	51	51	1.00	1.02	1.46	1.78				
80-9	115N06918	4 Evening	Weekday	AZ-80	Eastbound	49.5	48.8	32.9	28.0	51	51	51	1.03	1.05	1.55	1.82				
80-9	115N06916	1 AM Peak	Weekday	AZ-80	Eastbound	63.0	63.0	50.2	57.8	65	65	65	1.03	1.03	1.30	1.13	1.07	1.06	1.36	1.19
80-9	115N06916	2 Mid Day	Weekday	AZ-80	Eastbound	64.3	62.5	56.0	56.9	65	65	65	1.01	1.04	1.16	1.14				
80-9	115N06916	3 PM Peak	Weekday	AZ-80	Eastbound	64.9	61.5	57.8	54.7	65	65	65	1.00	1.06	1.13	1.19				
80-9	115N06916	4 Evening	Weekday	AZ-80	Eastbound	61.0	61.7	47.9	54.7	65	65	65	1.07	1.05	1.36	1.19				
80-10	115N05850	1 AM Peak	Weekday	AZ-80	Eastbound	56.7	56.6	27.7	29.8	63	63	63	1.11	1.11	2.27	2.11	1.11	1.13	2.27	2.25
80-10	115N05850	2 Mid Day	Weekday	AZ-80	Eastbound	59.0	55.5	34.8	29.8	63	63	63	1.07	1.13	1.81	2.11				
80-10	115N05850	3 PM Peak	Weekday	AZ-80	Eastbound	59.8	55.6	36.4	28.0	63	63	63	1.05	1.13	1.73	2.25				
80-10	115N05850	4 Evening	Weekday	AZ-80	Eastbound	59.0	56.4	39.7	31.1	63	63	63	1.07	1.12	1.59	2.03				
80-10	115N06916	1 AM Peak	Weekday	AZ-80	Eastbound	63.0	63.0	50.2	57.8	65	65	65	1.03	1.03	1.30	1.13	1.07	1.06	1.36	1.19
80-10	115N06916	2 Mid Day	Weekday	AZ-80	Eastbound	64.3	62.5	56.0	56.9	65	65	65	1.01	1.04	1.16	1.14				
80-10	115N06916	3 PM Peak	Weekday	AZ-80	Eastbound	64.9	61.5	57.8	54.7	65	65	65	1.00	1.06	1.13	1.19				
80-10	115N06916	4 Evening	Weekday	AZ-80	Eastbound	61.0	61.7	47.9	54.7	65	65	65	1.07	1.05	1.36	1.19				

Closure Data

Segment	Length (miles)	# of closures	Total miles of closures		Average Occurrences/Mile/Year	
			SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)
90-1	5	0	0.0	0.0	0.00	0.00
90-2	9	4	1.0	3.0	0.02	0.07
90-3	8	10	9.7	3.0	0.24	0.08
90-4	5	7	5.5	4.0	0.22	0.16
90-5	7	4	7.5	0.0	0.21	0.00
90-6	12	15	14.5	3.0	0.24	0.05
80-7	6	8	21.3	3.0	0.71	0.10
80-8	6	3	8.1	0.0	0.27	0.00
80-9	12	8	8.0	0.0	0.13	0.00
80-10	9	3	2.0	1.0	0.04	0.02

	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
Segment	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)
90-1	0	0	0	0	0	0	0	0	0	0	0	0
90-2	0	0	0	3	0	0	1	0	0	0	0	0
90-3	0	0	5	3	0	0	2	0	0	0	0	0
90-4	0	0	1	4	0	0	2	0	0	0	0	0
90-5	0	0	1	0	0	0	0	0	0	0	1	0
90-6	0	0	7	3	0	0	4	0	0	0	0	0
80-7	0	0	3	2	0	0	0	1	0	0	2	0
80-8	0	0	1	0	0	0	0	0	0	0	2	0
80-9	0	0	8	0	0	0	0	0	0	0	0	0
80-10	0	0	2	1	0	0	0	0	0	0	0	0

HPMS Data

SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/WB AADT	WEIGHTED AVERAGE SB/EB AADT	WEIGHTED AVERAGE AADT	NB/WB AADT	SB/EB AADT	2015 AADT	K Factor	D-Factor	T-Factor
90-1	290	295	4914	4811	9725	4784	4784	9568	10	50	20
90-2	295	304	4776	4706	9482	4780	4726	9507	10	50	17
90-3	304	312	5750	5768	11519	5823	5776	11600	10	50	12
90-4	312	317	7865	8044	15910	7813	7813	15626	9	50	9
90-5	317	324	7066	7345	14411	6735	7786	14521	9	54	7
90-6	324	336	2108	2108	4217	2317	2317	4634	11	50	7
80-7	333	339	2650	2898	5548	2553	2676	5229	9	51	10
80-8	339	345	2535	2534	5070	2827	2423	5250	9	57	16
80-9	345	357	2352	2351	4703	2504	2503	5007	8	50	19
80-10	357	365	2521	2539	5061	2321	2296	4618	10	50	22

SEGMENT	Loc ID	BMP	EMP	Length	Pos Dir AADT	Neg Dir AADT	Corrected Pos Dir AADT	Corrected Neg Dir AADT	2015 AADT	K Factor	D-Factor	D-Factor Adjusted	T-Factor
90-1	101069	289.54	294.54	5.00	4784	4556	4784	4784	9568	10	51	50	20
90-2	101069	294.54	298.50	3.96	4784	4556	4784	4784	9568	10	51	50	20
	101070	298.50	304.49	5.99	4777	4688	4777	4688	9467	10	50	50	14
90-3	101070	304.49	308.39	3.90	4777	4688	4777	4688	9467	10	50	50	14
	101071	308.39	311.78	3.39	7027	6981	7027	7027	14054	9	58	50	10
90-4	101072	311.78	313.60	1.82	7714	6928	7714	7714	15428	10	60	50	10
	101074	313.60	317.20	3.60	7863	9410	7863	7863	15726	9	60	50	8
90-5	101076	317.20	318.60	1.40	6040	8525	6040	8525	14565	9	61	59	8
	101078	318.60	319.60	1.00	6753	8552	6753	8552	15305	8	61	56	8
	101080	319.60	321.25	1.65	6492	7538	6492	7538	14030	8	61	54	7
	101082	321.25	321.52	0.27	9312	10713	9312	10713	20025	8	61	53	6
	101084	321.52	322.48	0.96	11029	10787	11029	10787	21816	8	61	51	6
	101086	322.48	324.00	1.52	10334	0	4457	4457	8913	11	62	50	6
90-6	101086	324.00	325.51	1.51	10334	0	4457	4457	8913	11	62	50	6
	101087	325.51	336.40	10.89	0	0	2021	2021	4041	11	62	50	8
80-7	100865	333.88	339.00	5.12	2553	2676	2553	2676	5229	9	53	51	10
80-8	100866	339.81	341.49	1.68	2229	698	2229	698	2927	10	61	76	19
	100867	341.49	343.30	1.81	2552	4230	3480	3480	6959	9	69	50	14
	100868	343.30	345.13	1.83	0	0	2851	2851	5701	8	58	50	17
	100865	339.00	339.81	0.81	2553	2676	2553	2676	5229	9	53	51	10
80-9	100869	345.13	348.06	2.93	0	0	2833	2833	5666	8	53	50	18
	100870	348.06	356.47	8.41	2087	2123	2403	2403	4805	8	55	50	19
	100871	356.47	357.08	0.61	2321	2296	2321	2296	4618	10	57	50	22
80-10	100871	357.08	364.67	7.59	2321	2296	2321	2296	4618	10	57	50	22

Bicycle Accommodation Data

Segment	BMP	EMP	Divided or Non	NB/EB Right Shoulder Width	SB/WB Right Shoulder Width	NB/EB Left Shoulder Width	SB/WB Left Shoulder Width	NB/EB Effective Length of Shoulder	SB/WB Effective Length of Shoulder	% Bicycle Accommodation
90-1	289.25	294.54	Divided	9.5	10.0	4.9	4.0	5.3	4.0	88%
90-2	294.54	304.49	Divided	10.0	10.0	4.0	4.0	9.9	9.9	100%
90-3	304.49	311.78	Divided	9.8	10.0	4.3	4.0	7.3	6.7	96%
90-4	311.78	317.2	Undivided	8.3	8.2	N/A	N/A	5.3	5.1	96%
90-5	317.2	323.99	Undivided	5.2	5.2	N/A	N/A	1.7	1.7	26%
90-6	323.99	336.4	Undivided	5.1	5.1	N/A	N/A	0.4	0.3	3%
80-7	333.88	339	Undivided	5.0	4.6	N/A	N/A	0.0	0.0	0%
80-8	339	345.13	Undivided	3.0	3.3	N/A	N/A	2.8	2.4	43%
80-9	345.13	357.08	Undivided	6.1	6.6	N/A	N/A	9.7	11.4	88%
80-10	357.08	364.67	Divided	8.5	8.7	5.4	5.4	7.3	7.4	97%

AZTDM Data

SEGMENT	Growth Rate	% Non-SOV
90-1	2.25%	14.1%
90-2	2.22%	14.6%
90-3	1.71%	17.2%
90-4	1.59%	17.3%
90-5	0.83%	19.2%
90-6	0.91%	15.6%
80-7	-2.53%	15.3%
80-8	-2.59%	16.4%
80-9	-4.08%	11.4%
80-10	-2.23%	14.9%

HERS Capacity Calculation Data

Segment	Capacity Environment Type	Facility Type	Terrain	Lane Width	NB/EB Rt. Shoulder	SB/WB Rt. Shoulder	F_{lw} or f_w or f_{LS}	NB/EB F_{lc}	SB/WB F_{lc}	Total Ramp Density	PHF	E_T	f_{HV}	f_M	f_A	g/C	f_G	f_{NP}	Nm	f_p	NB/EB FFS	SB/WB FFS	NB/EB Peak-Hour Capacity	SB/WB Peak-Hour Capacity	Major Direction Peak-Hour Capacity	Daily Capacity
90-1	3	Rural	Level	12.00	9.49	10.00	1.0	N/A	N/A	N/A	0.9	2	0.831	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1562.29	29,758
90-2	2	Rural	Level	12.00	10.00	10.00	0.0	0	0.4	N/A	0.88	1.5	0.923	0	0.17	N/A	N/A	N/A	N/A	N/A	62.83	62.43	3575	3575	N/A	68,098
90-3	3	Rural	Level	12.00	9.84	10.00	1.0	N/A	N/A	N/A	0.9	2	0.892	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1677.26	31,948
90-4	2	Rural	Level	12.00	8.34	8.23	0.0	0	0	N/A	0.88	1.5	0.958	1.6	0.6	N/A	N/A	N/A	N/A	N/A	52.80	52.80	3468	3468	N/A	66,051
90-5	3	Urban	Level	12.00	5.22	5.22	1.0	N/A	N/A	N/A	0.9	2	0.934	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1756.85	33,464
90-6	3	Rural	Level	12.00	5.08	5.10	1.0	N/A	N/A	N/A	0.9	2	0.931	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	875.36	16,673
80-7	4	Rural	Mountainous	12.00	5.00	4.61	0.0	N/A	N/A	N/A	0.88	7.2	0.610	N/A	0.29	N/A	0.62	3.30	N/A	N/A	63.71	63.71	N/A	N/A	437.81	8,339
80-8	3	Fringe Urban	Mountainous	12.00	3.02	3.30	1.0	N/A	N/A	N/A	0.9	2	0.863	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	811.87	15,464
80-9	4	Rural	Level	12.00	6.06	6.57	0.0	N/A	N/A	N/A	0.88	1.5	0.914	N/A	0.15	N/A	1	2.75	N/A	N/A	71.85	71.85	N/A	N/A	1507.94	28,723
80-10	3	Rural	Level	12.00	8.50	8.74	1.0	N/A	N/A	N/A	0.9	2	0.822	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1545.60	29,440

Safety Performance Area Data

Segment	Operating Environment	Segment Length (miles)	NB/WB Fatal Crashes 2011-2015	SB/EB Fatal Crashes 2011-2015	NB/WB Incapacitating Injury Crashes	SB/EB Incapacitating Injury Crashes	Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors
90-1	2 or 3 or 4 Lane Divided Highway	5.29	1	1	0	0	0
90-2	2 or 3 or 4 Lane Divided Highway	9.95	0	0	2	0	0
90-3	2 or 3 or 4 Lane Divided Highway	7.29	1	0	2	0	3
90-4	4 or 5 Lane Undivided Highway	5.42	1	1	3	1	4
90-5	4 or 5 Lane Undivided Highway	6.79	1	1	5	3	1
90-6	2 or 3 Lane Undivided Highway	12.41	2	0	6	1	4
80-7	2 or 3 Lane Undivided Highway	5.12	0	0	2	1	1
80-8	2 or 3 Lane Undivided Highway	6.13	0	0	0	0	0
80-9	2 or 3 Lane Undivided Highway	11.95	0	1	0	1	2
80-10	2 or 3 or 4 Lane Divided Highway	7.59	0	1	0	1	1

Segment	Operating Environment	Fatal + Incapacitating Injury Crashes Involving Trucks	Fatal + Incapacitating Injury Crashes Involving Motorcycles	Fatal + Incapacitating Injury Crashes Involving Non-Motorized Travelers	Weighted 5-Year (2011-2015) Average NB/WB AADT	Weighted 5-Year (2011-2015) Average SB/EB AADT	Weighted 5-Year (2011-2015) Average Total AADT
90-1	2 or 3 or 4 Lane Divided Highway	0	0	0	4914	4811	9725
90-2	2 or 3 or 4 Lane Divided Highway	0	1	0	4776	4706	9482
90-3	2 or 3 or 4 Lane Divided Highway	0	1	0	5750	5768	11519
90-4	4 or 5 Lane Undivided Highway	1	0	1	7865	8044	15910
90-5	4 or 5 Lane Undivided Highway	0	2	2	7066	7345	14411
90-6	2 or 3 Lane Undivided Highway	1	2	1	2108	2108	4217
80-7	2 or 3 Lane Undivided Highway	0	0	0	2650	2898	5548
80-8	2 or 3 Lane Undivided Highway	0	0	0	2535	2534	5070
80-9	2 or 3 Lane Undivided Highway	0	0	0	2352	2351	4703
80-10	2 or 3 or 4 Lane Divided Highway	0	1	1	2521	2539	5061

HPMS Data

2011-2015 Weighted Average						2015			2014			2013			2012			2011		
SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/WB AADT	WEIGHTED AVERAGE SB/EB AADT	WEIGHTED AVERAGE AADT	NB/WB AADT	SB/EB AADT	2015 AADT	NB/WB AADT	SB/EB AADT	2014 AADT	NB/WB AADT	SB/EB AADT	2013 AADT	NB/WB AADT	SB/EB AADT	2012 AADT	NB/WB AADT	SB/EB AADT	2011 AADT
90-1	290	295	4914	4811	9725	4784	4784	9568	4605	4605	9210	5016	4490	9506	5111	5123	10235	5054	5054	10107
90-2	295	304	4776	4706	9482	4780	4726	9507	4611	4555	9167	4700	4465	9165	4832	4837	9670	4957	4945	9902
90-3	304	312	5750	5768	11519	5823	5776	11600	5557	5686	11245	5536	5513	11050	5809	5849	11658	6027	6016	12043
90-4	312	317	7865	8044	15910	7813	7813	15626	7630	8054	15685	7495	7814	15309	8003	8153	16156	8386	8386	16772
90-5	317	324	7066	7345	14411	6735	7786	14521	7041	7190	14231	6738	7038	13776	7151	7046	14197	7665	7665	15330
90-6	324	336	2108	2108	4217	2317	2317	4634	1951	1951	3903	1946	1946	3892	2126	2126	4253	2200	2200	4401
80-7	333	339	2650	2898	5548	2553	2676	5229	2570	2629	5199	2386	2386	4772	3105	4198	7303	2637	2600	5237
80-8	339	345	2535	2534	5070	2827	2423	5250	2224	2638	4862	2425	2549	4975	2594	2515	5108	2606	2547	5154
80-9	345	357	2352	2351	4703	2504	2503	5007	2486	2502	4988	2343	2374	4718	2261	2250	4511	2168	2126	4294
80-10	357	365	2521	2539	5061	2321	2296	4618	2324	2288	4614	2276	2243	4520	3359	3595	6952	2326	2275	4602

Freight Performance Area Data

Segment	Length (miles)	# of closures	Total minutes of closures		Avg Mins/Mile/Year	
			NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)
90-1	5	0	0.0	0.0	0.00	0.00
90-2	9	4	473.0	84.0	10.51	1.87
90-3	8	10	683.0	1300.2	17.07	32.50
90-4	5	7	968.0	471.0	38.72	18.84
90-5	7	4	0.0	3065.0	0.00	87.57
90-6	12	15	627.0	3284.0	10.45	54.73
80-7	6	8	327.0	5702.2	10.90	190.07
80-8	6	3	0.0	3147.8	0.00	104.93
80-9	12	8	0.0	1140.0	0.00	19.00
80-10	9	3	123.0	272.0	2.73	6.04

	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
Segment	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)
90-1	0	0	0	0	0	0	0	0	0	0	0	0
90-2	0	0	0	3	0	0	1	0	0	0	0	0
90-3	0	0	5	3	0	0	2	0	0	0	0	0
90-4	0	0	1	4	0	0	2	0	0	0	0	0
90-5	0	0	1	0	0	0	0	0	0	0	1	0
90-6	0	0	7	3	0	0	4	0	0	0	0	0
80-7	0	0	3	2	0	0	0	1	0	0	2	0
80-8	0	0	1	0	0	0	0	0	0	0	2	0
80-9	0	0	8	0	0	0	0	0	0	0	0	0
80-10	0	0	2	1	0	0	0	0	0	0	0	0

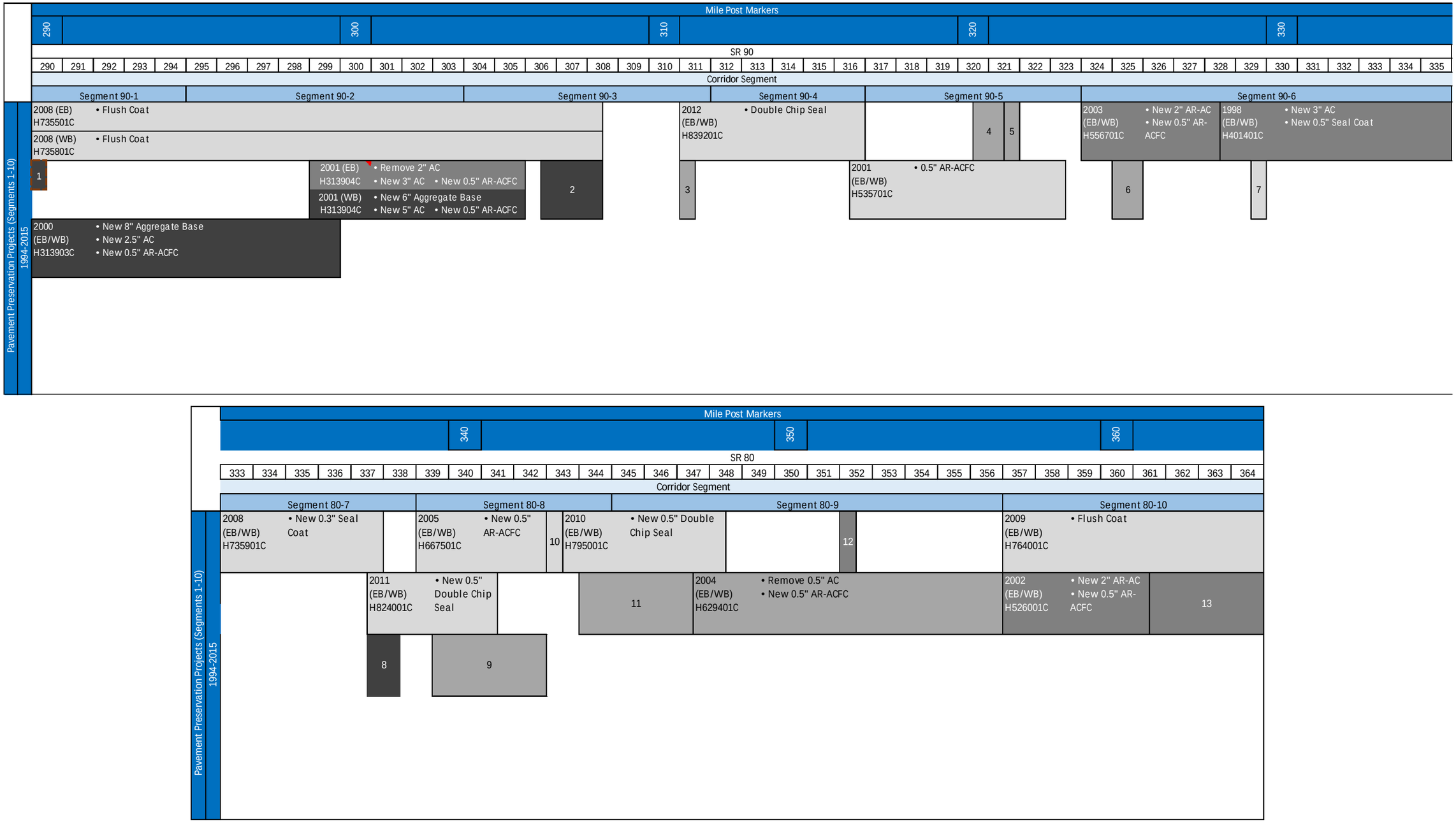
See the **Mobility Performance Area Data** section for other Freight Performance Area related data.

Appendix D: Needs Analysis Contributing Factors and Scores

Pavement Performance Needs Analysis

Segment	Segment Length (miles)	Segment Mileposts (MP)	Final Need	Bid History Investment	PeCos History Investment	Resulting Historical Investment	Contributing Factors and Comments
90-1	5	290 - 295	None	Low	High	Medium	
90-2	9	295 - 304	None	Low	Medium	Low	
90-3	8	304 - 312	Low	Low	Low	Low	Hot spot SB/EB MP 311-312
90-4	5	312 - 317	Low	Low	Low	Low	
90-5	7	317 - 324	Medium	Low	Medium	Low	
90-6	12	324 - 336	None	Low	Low	Low	
80-7	6	333 - 339	None	Low	Low	Low	
80-8	6	339 - 345	Low	Low	Low	Low	
80-9	12	345 - 357	None	Low	Low	Low	
80-10	8	357 - 365	Low	Medium	Low	Medium	Hot spot NB/WB MP 364-365

Pavement History



Pavement Treatment Reference Numbers	
1. 1998 (EB) H650401C: 4" Aggregate Base, 10" PC, 1" AR-ACFC	**8. 1996 (EB/WB) H301701C:** 5" Aggregate Base, 4" AC, 0.3" Seal Coat
2. 2000 (EB/WB) H313902C: 6" Aggregate Base, 6" AC, 0.5" AR-ACFC	**9. 2002 (EB/WB) H525901C:** Remove 2" AC, 2" AR-AC
3. 2010 (EB/WB) H804201C: Remove 3" AC, 2.5" AC, 0.5" ACFC	**10. 2011 (EB/WB) H795001C:** Micro Seal
4. 2009 (EB/WB) H740401C: Remove 0.5" AC, 0.5" ACFC	**11. 2000 (EB/WB) H422901C:** Remove 2" AC, 2" AR-AC
5. 2009 (EB/WB) H769201C: Remove 0.5" AC, 0.5" AR-ACFC	**12. 2003 (EB/WB) H638601C:** 2" AC
6. 2007 (EB/WB) HX17401C: Remove 0.5" AC, 0.5" AR-ACFC	**13. 1998 (EB/WB) H3986011C:** 2" AC, 0.5" AR-ACFC
7. 2003 (EB/WB) H523701C: 0.3" Seal Coat	

Legend

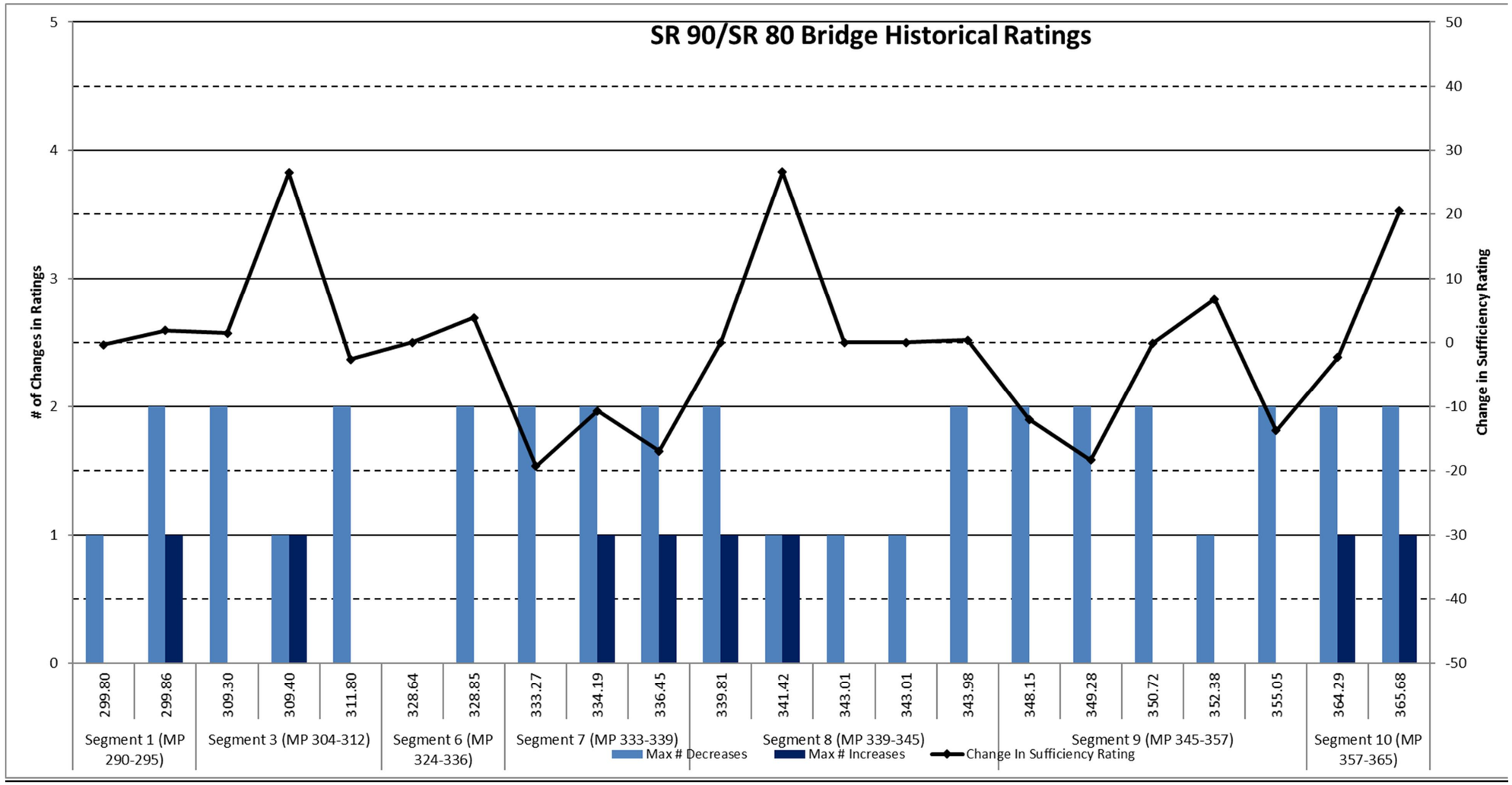
- New Paving or Reconstruction
- Mill and Overlay (Adding Structural Thickness)
- Mill and Replace (No Change Structural Thickness)
- Fog Coat or Thin Overlay Treatments
- PCCP Pavement Border
- AC Pavement Border

Value	Level	Segment Number																			
		1		2		3		4		5		6		7		8		9		10	
		Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir
1	L1	100%		100%		56%	13%		100%		93%		4%		83%		67%		29%		100%
1		100%		100%		56%			10%						25%		8%				
1																	25%				
1																	42%				
3	L2						6%				14%		8%				17%		21%		
3											7%						58%		79%		
3																					
3																					
3																					
3																					
4	L3			56%		25%							38%						4%		56%
4													63%								44%
4																					
4																					
6	L4	5%	100%	56%	56%	25%	25%								17%						
6																					
6																					
6																					
6																					
6																					
Sub-Total		2.3	6.0	7.6	3.3	3.6	1.8	0.0	1.1	0.0	1.6	0.0	4.3	0.0	2.1	0.0	3.7	0.0	3.5	0.0	5.0
Total		**7.2**		**7.1**		**3.6**		**1.1**		**1.6**		**4.3**		**2.1**		**3.7**		**3.5**		**5.0**	

Bridge Performance Needs Analysis

Segment #	Segment Length (Miles)	Segment Mileposts (MP)	Number of Bridges in Segment	# Functionally Obsolete Bridges	Final Need	Contributing Factors			Comments
						Bridge	Current Ratings	Historical Review	
90-1	5	290 - 295	0	0	None	No bridges with current ratings less than 6 and no historical issues			
90-2	9	295 - 304	2	0	None	No bridges in segment			
90-3	8	304 - 312	3	0	None	No bridges with current ratings less than 6 and no historical issues			
90-4	5	312 - 317	0	0	None	No bridges in segment			
90-5	7	317 - 324	0	0	None	No bridges in segment			
90-6	12	324 - 336	2	0	Low	Lewis Springs OP (#470)(MP 328.85)	2016 Substructure, deck rating of 5	No historical issues	
80-7	6	333 - 339	3	1	Low	Bridge (#468) (MP 336.45)	2016 Superstructure rating of 5	No historical issues	
80-8	6	339 - 345	5	1	Low	West Blvd TI OP (#614)(MP 339.81)	2016 Superstructure ratiing of 5	No historical issues	
80-9	12	345 - 357	5	0	Medium	Bridge (#235)(MP 349.28) Glance Creek Bridge (#237)(MP 352.38) Mulepass-Lowell Arch (#130)(MP 348.15)	2016 Substructure, deck rating of 5 2016 Deck, substructure, superstructure of 5 2016 substructure rating of 5	No historical issues	Programmed project H8914, FY 2018, Glance Creek Bridge (#237), construct Bridge Rehabilitation.
80-10	8	357 - 365	1	0	Medium	White Water Draw Br (#175)(MP 365.68)	2016 deck rating of 5	No historical issues	

Bridge Ratings History



O identifies the bridge indicated is of concern from a historical ratings perspective

Maximum # of Decreases: Maximum number of times that the Deck Rating, Substructure Rating, or Superstructure Rating decreased from 1997 to 2014. (Higher number could indicate a more dramatic decline in the performance of the bridge)

Maximum # of Increases: Maximum number of times that the Deck Rating, Substructure Rating, or Superstructure Rating increased from 1997 to 2014. (Higher number could indicate a higher level of investment)

Change in Sufficiency Rating: Cumulative change in Sufficiency Rating from 1997 to 2014. (Bigger negative number could indicate a more dramatic decline in the performance of the bridge)

Mobility Performance Needs Analysis

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Roadway Variables								Traffic Variables					Relevant Mobility Related Existing Infrastructure
				Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2035 LOS	% Trucks	NB Buffer Index (PTI-TTI)	SB Buffer Index (PTI-TTI)	
90-1	290 - 295	5	Low	State Highway	Rural	Level	4	45-65	No	Divided	0%	A/B	A/B	20%	5.73	1.61	Grade separated traffic interchange I-10/SR 90
90-2	295 - 304	9	Low	State Highway	Rural	Level	4	55-65	No	Divided	0%	A/B	A/B	17%	3.72	0.11	United States Customs and Border Patrol MP 304.5
90-3	304 - 312	8	None	State Highway	Rural	Level	4	55-65	No	Divided	0%	A/B	A/B	12%	0.91	0.64	Traffic Signal at the SR 90/SR 82; United States Customs and Border Patrol MP 304.5 DMS NB MP 309.9 and SB MP 306.4
90-4	312 - 317	5	Low	State Highway	Rural	Level	4	45-65	No	Non-Divided	0%	A/B	A/B	9%	0.54	1.09	
90-5	317 - 324	7	Low	State Highway	Urban	Level	4	45-55	No	Non-Divided	0%	A-C	A-C	7%	6.57	5.05	Seven Traffic Signals
90-6	324 - 336	12	Low	State Highway	Rural	Level	2	45-65	No	Non-Divided	25%	A/B	A/B	7%	1.01	0.73	Traffic Signal at Moson Road
80-7	333 - 339	6	Low	State Highway	Rural	Mountainous	2	45-55	No	Non-Divided	50%	A/B	A/B	10%	0.26	0.66	Passing lane MP 337-338
80-8	339 - 345	6	Low	State Highway	FringeUrban	Mountainous	2	25-55	No	Non-Divided	50%	A-C	A-C	16%	0.75	0.87	Traffic Roundabout
80-9	345 - 357	12	Low	State Highway	Rural	Level	2	55-65	No	Non-Divided	25%	A/B	A/B	19%	0.56	0.37	
80-10	357 - 365	8	None	State Highway	Rural	Level	4	55-65	No	Divided	0%	A/B	A/B	20%	0.49	0.73	Traffic Signal at US 191 Intersection

Mobility Performance Needs Analysis (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
90-1	290 - 295	5	Low	0	0	0%	0	0%	0	0%			
90-2	295 - 304	9	Low	4	3	75%	1	25%	0	0%			Percentage of closures due to obstructions/hazards above the statewide average (25% to 3%)
90-3	304 - 312	8	None	10	8	80%	2	20%	0	0%			Percentage of closures due to obstructions/hazards above the statewide average (20% to 3%)
90-4	312 - 317	5	Low	7	5	71%	2	29%	0	0%	US Customs and Enforcement Border Patrol Checkpoint NB MP 304.5	Programmed (2017) Buffalo Soldier Trail (SR 90)/Hatfield Street intersection construction.	Percentage of closures due to obstructions/hazards above the statewide average (29% to 3%)
90-5	317 - 324	7	Low	4	1	25%	0	0%	1	25%	US Customs and Enforcement Border Patrol Checkpoint NB MP 304.5	Programmed (2017) Buffalo Soldier Trail (SR 90)/Hatfield Street intersection construction.	Percentage of closures due to weather above the statewide average (25% to 1%)
90-6	324 - 336	12	Low	15	10	67%	4	27%	0	0%			Percentage of closures due to obstructions/hazards above the statewide average (27% to 3%)
80-7	333 - 339	6	Low	8	5	63%	1	13%	2	25%			Percentage of closures due to obstructions/hazards above the statewide average (13% to 3%); percentage of closures due to weather above the statewide average (25% to 1%)
80-8	339 - 345	6	Low	3	1	33%	0	0%	2	67%			Percentage of closures due to weather above the statewide average (67% to 1%)
80-9	345 - 357	12	Low	8	8	100%	0	0%	0	0%			Percentage of closures due to incidents/accidents above the statewide average (100% to 96%)
80-10	357 - 365	8	None	3	3	100%	0	0%	0	0%			Percentage of closures due to incidents/accidents above the statewide average (100% to 96%)

Safety Performance Needs Analysis

Segment Number		90-1	90-2	90-3	90-4	90-5	90-6	80-7	80-8	80-9	80-10	Corridor-Wide Crash Characteristics
Segment Length (miles)		5	9	8	5	7	12	6	6	12	8	
Segment Milepost (MP)		290 - 295	295 - 304	304 - 312	312 - 317	317 - 324	324 - 336	333 - 339	339 - 345	345 - 357	357 - 365	
Final Need		N/A	None	Low	Low	Low	High	None	None	Low	Low	
Segment Crash Overview		2 Crashes were fatal 0 Crashes had incapacitating injuries 0 Crashes involve trucks 0 Crashes involve Motorcycles	0 Crashes were fatal 2 Crashes had incapacitating injuries 0 Crashes involve trucks 1 Crashes involve Motorcycles	1 Crashes were fatal 2 Crashes had incapacitating injuries 0 Crashes involve trucks 1 Crashes involve Motorcycles	2 Crashes were fatal 4 Crashes had incapacitating injuries 1 Crashes involve trucks 0 Crashes involve Motorcycles	2 Crashes were fatal 8 Crashes had incapacitating injuries 0 Crashes involve trucks 2 Crashes involve Motorcycles	2 Crashes were fatal 7 Crashes had incapacitating injuries 1 Crashes involve trucks 2 Crashes involve Motorcycles	0 Crashes were fatal 3 Crashes had incapacitating injuries 0 Crashes involve trucks 0 Crashes involve Motorcycles	No Fatal or Incapacitating Injury Crashes in this Segment	1 Crashes were fatal 1 Crashes had incapacitating injuries 0 Crashes involve trucks 0 Crashes involve Motorcycles	1 Crashes were fatal 2 Crashes had incapacitating injuries 0 Crashes involve trucks 1 Crashes involve Motorcycles	11 Crashes were fatal 29 Crashes had incapacitating injuries 2 Crashes involve trucks 7 Crashes involve Motorcycles
Segment Crash Summaries (Fatal and Serious Injury Crashes)	First Harmful Event Type	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	83% Involve Collision with Motor Vehicle 17% Involve Collision with Pedestrian	50% Involve Collision with Motor Vehicle 10% Involve Collision with Pedalcyclist 10% Involve Collision with Animal	56% Involve Collision with Motor Vehicle 22% Involve Overturning 11% Involve Collision with Pedalcyclist	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	45% Involve Collision with Motor Vehicle 25% Involve Collision with Fixed Object 10% Involve Collision with Pedestrian
	Collision Type	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	33% Involve Angle 33% Involve Rear End 17% Involve Head On	30% Involve Single Vehicle 20% Involve Angle 20% Involve Left Turn	33% Involve Single Vehicle 22% Involve Left Turn 11% Involve Sideswipe (same)	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	38% Involve Single Vehicle 15% Involve Other 13% Involve Angle
	Violation or Behavior	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	50% Involve Inattention/Distraction 17% Involve Exceeded Lawful Speed 17% Involve Failure to Keep in Proper Lane	30% Involve No Improper Action 20% Involve Disregarded Traffic Signal 10% Involve Exceeded Lawful Speed	33% Involve Failure to Yield Right-of-Way 22% Involve Inattention/Distraction 22% Involve Speed too Fast for Conditions	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	15% Involve Inattention/Distraction 13% Involve No Improper Action 13% Involve No Improper Action
	Lighting Conditions	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	83% Occur in Daylight Conditions 17% Occur in Dark-Unknown Lighting Conditions	50% Occur in Daylight Conditions 20% Occur in Dark-Lighted Conditions 20% Occur in Dark-Unlighted Conditions	67% Occur in Daylight Conditions 33% Occur in Dark-Unlighted Conditions	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	60% Occur in Daylight Conditions 23% Occur in Dark-Unlighted Conditions 8% Occur in Dark-Lighted Conditions
	Surface Conditions	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	83% Involve Dry Conditions 17% Involve Unknown Conditions	80% Involve Dry Conditions 10% Involve Wet Conditions 10% Involve Oil Conditions	78% Involve Dry Conditions 22% Involve Wet Conditions	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	83% Involve Dry Conditions 13% Involve Wet Conditions 3% Involve Oil Conditions
	First Unit Event	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	83% Involve a first unit event of Motor Vehicle in Transport 17% Involve a first unit event of Collision with Pedestrian	60% Involve a first unit event of Motor Vehicle in Transport 10% Involve a first unit event of Collision with Animal 10% Involve a first unit event of Other Non-Collision	44% Involve a first unit event of Motor Vehicle in Transport 22% Involve a first unit event of Ran Off the Road (Right) 11% Involve a first unit event of Collision with Pedestrian	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	48% Involve a first unit event of Motor Vehicle in Transport 18% Involve a first unit event of Ran Off the Road (Right) 10% Involve a first unit event of Collision with Pedestrian
	Driver Physical Condition	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	50% No Apparent Influence 33% Unknown 17% Under the Influence of Drugs or Alcohol	70% No Apparent Influence 20% Illness 10% Under the Influence of Drugs or Alcohol	78% No Apparent Influence 22% Under the Influence of Drugs or Alcohol	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	50% No Apparent Influence 23% Unknown 18% Under the Influence of Drugs or Alcohol
	Safety Device Usage	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	67% Shoulder And Lap Belt Used 17% Air Bag Deployed/Shoulder-Lap Belt 17% Unknown	50% Shoulder And Lap Belt Used 20% Not Applicable 10% Air Bag Deployed	67% Shoulder And Lap Belt Used 22% None Used 11% Helmet Used	N/A - Sample size too small		N/A - Sample size too small	N/A - Sample size too small	53% Shoulder And Lap Belt Used 13% Helmet Used 10% None Used
Hot Spot Crash Summaries					MP 313-315; MP 316-317	MP 319-323						
Previously Completed Safety-Related Projects		None	None	None	Pedestrian Walkway - Town of Huachuca City, 2015	Construct lighting and multi-use path (MP 321.2-322.5), 2014	None	Pavement rehab RR 3" & AR-ACFC, 2015 (MP 333-339)	None	None	None	
District Interviews/Discussions		Review SVMPO/SEAGO STSP (typical for all segments)						Review passing opportunities to improve congest and safety				
Contributing Factors		Need a gradual program of shoulder widening and shoulder improvements (add as safety elemetn to pavement preservation projects (typical of all segments; further analysis required)										

Freight Performance Needs Analysis

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Roadway Variables								Traffic Variables					Relevant Freight Related Existing Infrastructure
				Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2035 LOS	% Trucks	NB/WB Buffer Index (TPTI-TTTI)	SB/EB Buffer Index (TPTI-TTTI)	
90-1	290 - 295	5	High	State Highway	Rural	Level	4	45-65	No	Divided	0%	A-C	A-C	20%	7.35	1.43	Grade separated traffic interchange I-10/SR 90
90-2	295 - 304	9	Low	State Highway	Rural	Level	4	55-65	No	Divided	0%	A-C	A-C	17%	4.87	0.08	US Customs and Enforcement Border Patrol Checkpoint NB MP 304.5
90-3	304 - 312	8	None	State Highway	Rural	Level	4	55-65	No	Divided	0%	A-C	A-C	12%	1.85	1.65	US Customs and Enforcement Border Patrol Checkpoint NB MP 304.5; DMS NB MP 309.9 and SB MP 306.4
90-4	312 - 317	5	High	State Highway	Rural	Level	4	45-65	No	Non-Divided	0%	A-C	A-C	9%	1.53	3.97	
90-5	317 - 324	7	High	State Highway	Urban	Level	4	45-55	No	Non-Divided	0%	A-C	A-C	7%	4.05	5.02	
90-6	324 - 336	12	None	State Highway	Rural	Level	2	45-65	No	Non-Divided	25%	A-C	A-C	7%	2.14	1.62	
80-7	333 - 339	6	High	State Highway	Rural	Mountainous	2	45-55	No	Non-Divided	50%	A-C	A-C	10%	0.41	1.04	Passing lane MP 337-338; Informal pull-off areas throughout the segment
80-8	339 - 345	6	Low	State Highway	Fringe Urban	Mountainous	2	25-55	No	Non-Divided	50%	A-C	A-C	16%	1.12	0.95	Informal pull-off areas throughout the segment
80-9	345 - 357	12	High	State Highway	Rural	Level	2	55-65	No	Non-Divided	25%	A-C	A-C	19%	0.67	0.36	Informal pull-off areas throughout the segment
80-10	357 - 365	8	None	State Highway	Rural	Level	4	55-65	No	Divided	0%	A-C	A-C	20%	0.53	0.62	

Freight Performance Needs Analysis (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
90-1	290 - 295	5	High	0	0	0%	0	0%	0	0%			
90-2	295 - 304	9	Low	4	3	75%	1	25%	0	0%			Percentage of closures due to obstructions/hazards above the statewide average (25% to 3%)
90-3	304 - 312	8	None	10	8	80%	2	20%	0	0%	US Customs and Enforcement Border Patrol Checkpoint NB MP 304.5		Percentage of closures due to obstructions/hazards above the statewide average (20% to 3%)
90-4	312 - 317	5	High	7	5	71%	2	29%	0	0%	US Customs and Enforcement Border Patrol Checkpoint NB MP 304.5	Programmed (2017) Buffalo Soldier Trail (SR 90)/Hatfield Street intersection construction, but there is already an intersection there. Maybe intersection improvements - need to verify.	Percentage of closures due to obstructions/hazards above the statewide average (29% to 3%)
90-5	317 - 324	7	High	4	1	25%	0	0%	1	25%		Programmed (2017) Buffalo Soldier Trail (SR 90)/Hatfield Street intersection construction, but there is already an intersection there. Maybe intersection improvements - need to verify.	Percentage of closures due to weather above the statewide average (25% to 1%)
90-6	324 - 336	12	None	15	10	67%	4	27%	0	0%			Percentage of closures due to obstructions/hazards above the statewide average (27% to 3%)
80-7	333 - 339	6	High	8	5	63%	1	13%	2	25%			Percentage of closures due to obstructions/hazards above the statewide average (13% to 3%); percentage of closures due to weather above the statewide average (25% to 1%)
80-8	339 - 345	6	Low	3	1	33%	0	0%	2	67%			Percentage of closures due to weather above the statewide average (67% to 1%)
80-9	345 - 357	12	High	8	8	100%	0	0%	0	0%			Percentage of closures due to incidents/accidents above the statewide average (100% to 96%)
80-10	357 - 365	8	None	3	3	100%	0	0%	0	0%			Percentage of closures due to incidents/accidents above the statewide average (100% to 96%)

Needs Summary Table

Performance Area	90-1	90-2	90-3	90-4	90-5	90-6	80-7	80-8	80-9	80-10
	MP 290-295	MP 295-304	MP 304-312	MP 312-317	MP 317-324	MP 324-336	MP 333-339	MP 339-345	MP 345-357	MP 357-365
Pavement	None	None	Low	Low	Medium	None	None	Low	None	Low
Bridge	None	None	None	None	None	Low	Low	Low	Medium	Medium
Mobility*	Low	Low	None	Low	Low	Low	Low	Low	Low	None
Safety*	N/A	None	Low	Low	Low	High	None	None	Low	Low
Freight*	High	Low	None	High	High	None	High	Low	High	None
Average Need	**0.85**	**0.38**	**0.46**	**1.31**	**1.54**	**1.00**	**1.00**	**0.77**	**1.38**	**0.77**

Level of Need	Average Need Range
None⁺	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

* Identified as Emphasis Areas for SR 90/SR 80 Corridor
# N/A indicates insufficient or no data available to determine level of need
⁺ A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study